

STATE OF TENNESSEE

BIENNIAL REPORT

OF THE

DEPARTMENT OF AGRICULTURE

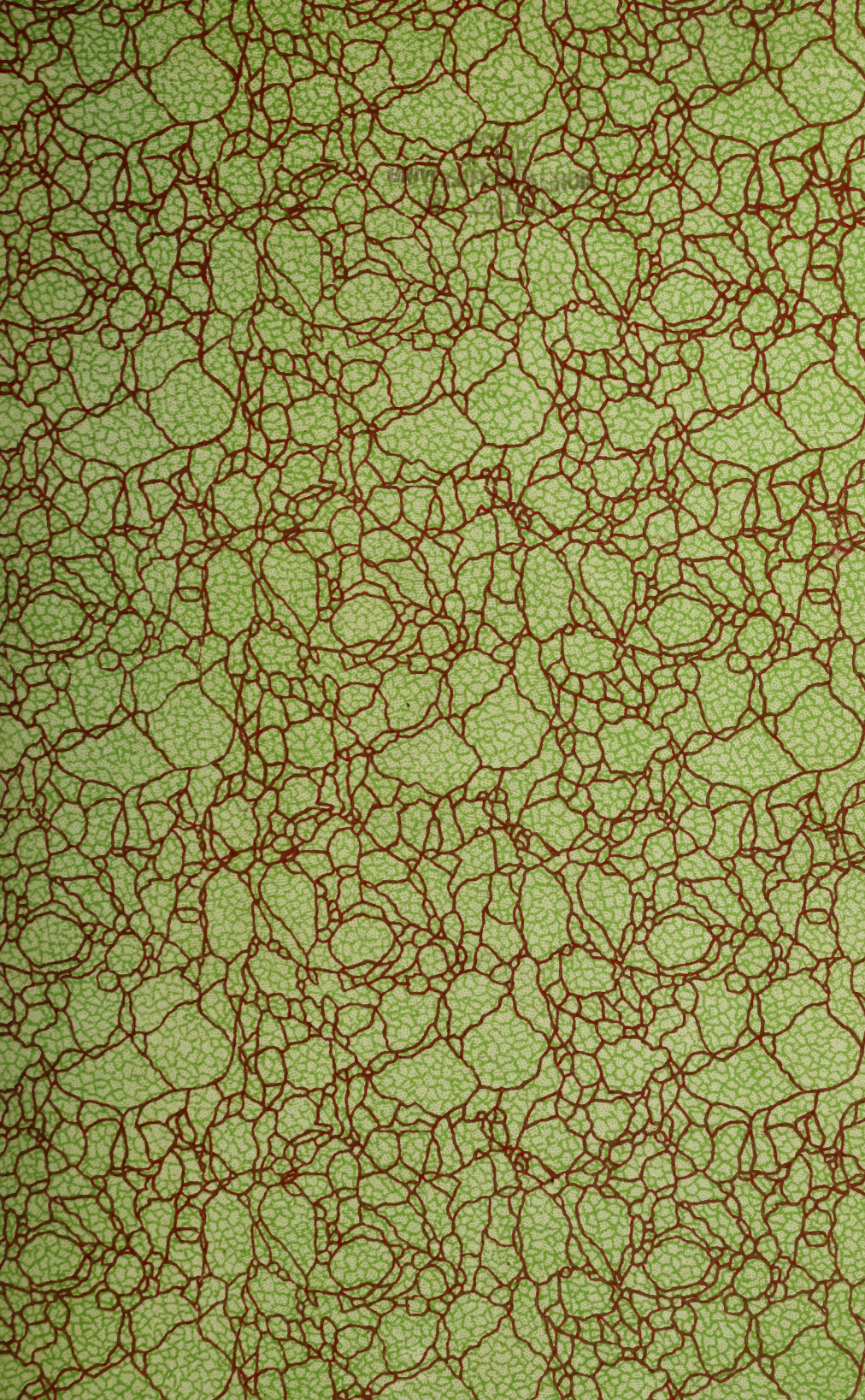
1913-1914

T. F. PECK, COMMISSIONER

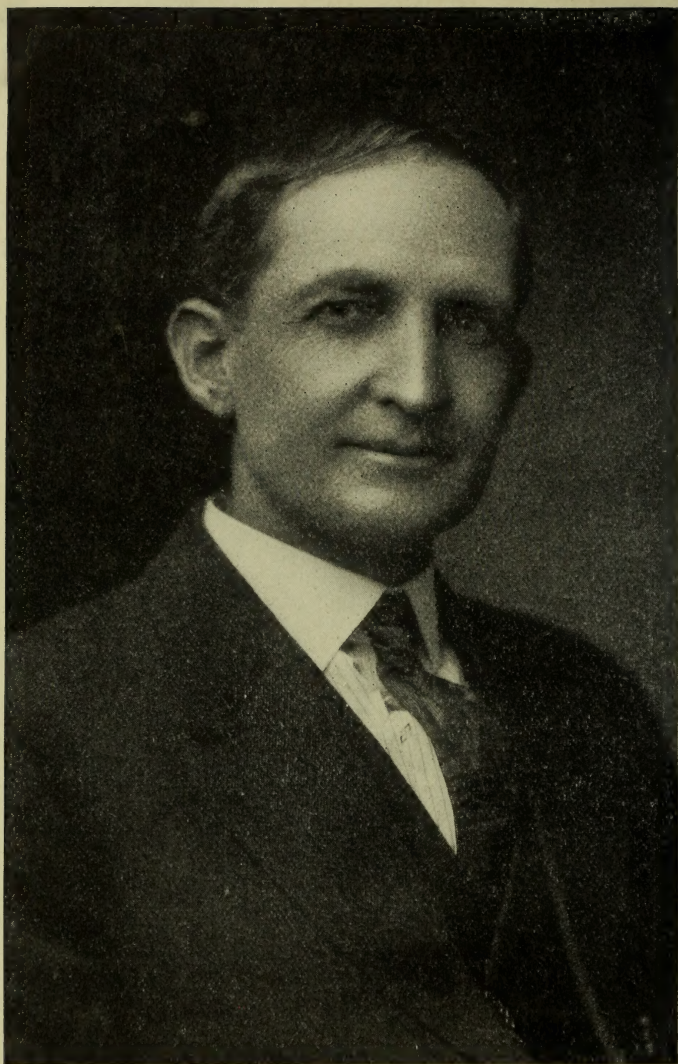


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Biennial Report

OF THE

Department of Agriculture

1913-1914

T. F. PECK, Commissioner



Nashville, Tenn.
FOSTER & PARKES COMPANY
1915

DEPARTMENT OF AGRICULTURE.

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DR. GEORGE R. WHITE, State Veterinarian	Nashville
JESSE TOMLINSON, Asst. Commissioner, Middle Tenn.....	Columbia
R. T. DEBERRY, Asst. Commissioner, West Tenn.....	Humboldt
J. A. DINWIDDIE, Asst. Commissioner, East Tenn.....	Newmarket
A. L. GARRISON, Chief Feed, Seed and Fertilizer Inspector..	Crossville
J. W. WYNN, Feed, Seed and Fertilizer Inspector, East Tennessee	Sevierville
N. C. WHITE, Feed, Seed and Fertilizer Inspector, Middle Tennessee	Pulaski
A. M. STOUT, Feed, Seed and Fertilizer Inspector, West Tennessee	Greenfield
DR. J. S. WARD, State Inspector of Apiaries	Nashville
J. W. SAMPLE, State Chemist	Nashville
H. N. HARDEMAN, Stenographer.....	Nashville

BUREAU OF IMMIGRATION.

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STATE OF TENNESSEE
DEPARTMENT OF AGRICULTURE
BIENNIAL REPORT OF COMMISSIONER.

His Excellency, B. W. Hooper, Governor.

SIR—In compliance with the law, I submit herewith my second biennial report (for 1913-14). I can assure you that during that time substantial progress has been made towards better agriculture in Tennessee.

Anyone who travels over the State may see evidences of intelligent effort on the part of the farmers to conserve their soils, improve their live stock and take more interest in improving their home surroundings. There is a tendency to greater diversification of crops, an inclination on the part of the farmer to produce on the farm more of what his family consumes. The farmers of the State are taking more interest than ever before in deep tillage, cover crops and conservation of moisture.

While the Department has increased its efficiency in the enforcement of the agricultural laws for the protection of the interests of the farmers, it has also been active in helping and encouraging the small farmer—the backward and indifferent farmer—to improve his methods of farming. This work has been done through neighborhood farmers' meetings, farmers' institutes, the operation of the agricultural demonstration train, and through weekly "Talks to Farmers" in the newspapers of the State. The Department has tried to get directly in touch with the farmers and help them solve their individual problems.

Since my last biennial report I am pleased to report the release of the entire State from the Texas fever quarantine, and the establishment and successful operation for more than a year of one of the best plants in the United States for the manufacture of anti-hog cholera serum. This plant has already saved to the farmers of Tennessee more than one million dollars in the prevention of hog cholera.

I can also report the establishment and successful operation for eighteen months of a chemical laboratory, where thousands of samples of feed, seed and fertilizers have been analyzed, as well as samples from farmers of limestone, minerals, etc.

I append to this report detailed reports of the work done by Prof. G. M. Bentley, State Entomologist; Dr. Geo. R. White, State Veterinarian; A. L. Garrison, Chief Feed, Seed and Fertilizer Inspector; and Dr. J. S. Ward, State Apiary Inspector. I want to say

in this connection that each of the above named men has done his work thoroughly and well, and has neglected nothing that he could do with available funds for the efficiency of his branch of the Department.

I also want to commend the efficient work of T. G. Settle, Chief Clerk for the Department. The volume of work accomplished by him I do not believe can be duplicated, while the character of work is of the highest order, thorough in every detail. Hoyt N. Hardeman, Stenographer for the Department, has no superior. His work has been thorough, prompt and satisfactory in every way.

I submit herewith financial statement showing receipts and disbursements for the biennial period 1913-14, which shows that the Department has been no burden to the taxpayers of Tennessee.

FINANCIAL REPORT.

Following is a statement of the receipts and disbursements of the Department of Agriculture from December 20, 1912 (the time of the last biennial report), to December 31, 1914, inclusive:

RECEIPTS.

From sale of fertilizer tags from Dec. 20, 1912, to Dec. 31, 1914	\$ 92,837.05
From sale of seed inspection stamps from Dec. 20, 1912, to Dec. 31, 1914	6,606.14
From sale of feed inspection stamps from Dec. 20, 1912, to Dec. 31, 1914	45,488.46
Interest on deposits	1,242.34
Total	\$146,173.99
Balance on hand from sale of feed inspection stamps at time of last report	20,727.76

DISBURSEMENTS.

Paid into State Treasury from sale of fertilizer tags from Dec. 20, 1912, to Dec. 31, 1914	\$92,837.05
Paid into State Treasury from sale of seed inspection stamps from Dec. 20, 1912, to Dec. 31, 1914	6,606.14
Paid into State Treasury from sale of feed inspection stamps from Dec. 20, 1912, to Dec. 31, 1914	60,433.82—\$159,877.01
Balance on hand Dec. 31, 1914	\$ 7,024.74

RECAPITULATION.

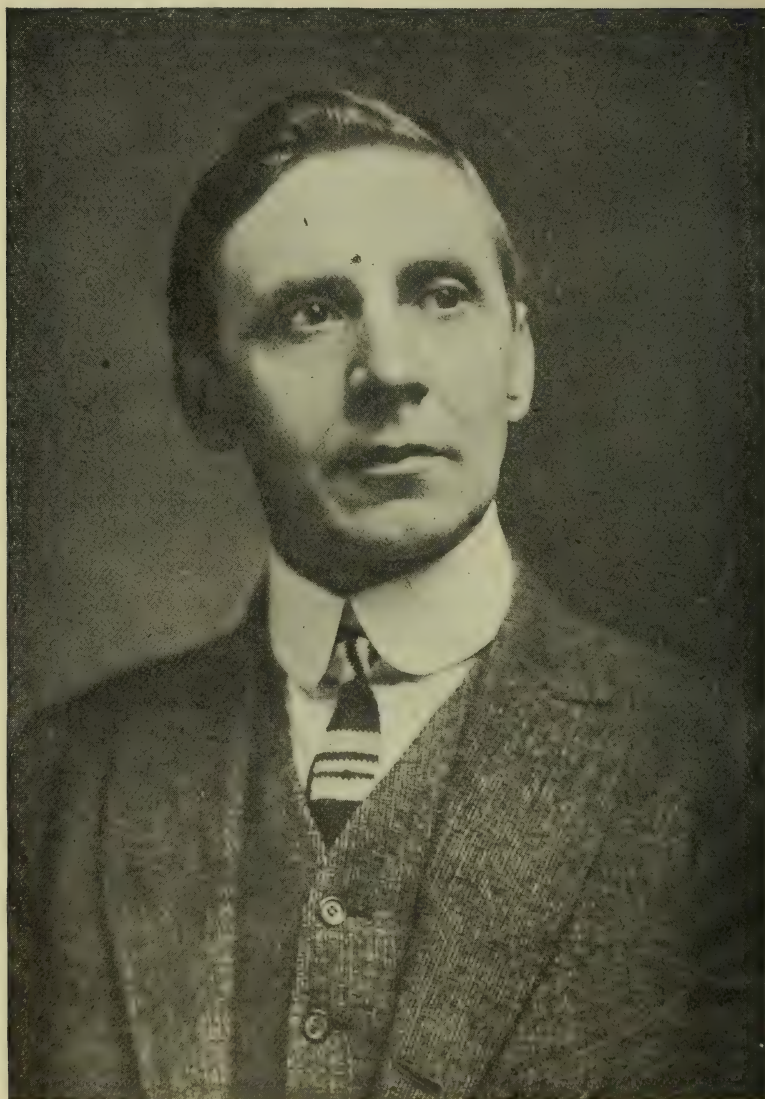
Total amount collected from sale of fertilizer tags from June 1, 1911, to December 31, 1914	\$144,560.58
Total amount collected from sale of seed inspection stamps from June 1, 1911, to Dec. 31, 1914	11,742.53
Total amount collected from sale of feed inspection stamps from June 1, 1911, to Dec. 31, 1914	76,885.25
Interest collected on deposits	1,242.34
	<hr/>
	\$234,430.70
Paid into State Treasury on sale of fertilizer tags from June 1, 1911, to Dec. 31, 1914. .	\$144,560.58
Paid into State Treasury on sale of seed inspection stamps from June 1, 1911, to Dec. 31, 1914	11,742.53
Paid into State Treasury on sale of feed in- spection stamps from June 1, 1911, to Dec. 31, 1914	71,102.85—\$227,405.96
	<hr/>
Balance on hand Dec. 31, 1914	\$ 7,024.74

APPROPRIATIONS.

The biennial appropriations by the General Assemblies of 1911 and 1913, for the Department of Agriculture were, respectively, \$71,700 and \$83,800, making a total for the four years of \$155,000. These appropriations included salaries and all funds expended under the direction of the Commissioner of Agriculture, and among them were, by the General Assembly of 1913, an appropriation of \$10,000 for the establishment of a plant for the manufacture of anti-hog cholera serum and \$7,000 for the establishment of a laboratory for the analysis of fertilizer, field seeds and mixed feeds. These biennial appropriations also included, in the amounts stated, funds for the eradication of contagious animal diseases, for apiary inspection, entomological work, farmers' institutes, and the work of the Bureau of Immigration in advertising the State and inducing desirable immigration.

SERUM PLANT AND LABORATORY.

The anti-hog cholera serum plant has been established and is in successful operation, and is furnishing the farmers of the State serum at the cost of production. The plant has been built up with the proceeds of sale of serum to the point where it is recognized as one of the best in the United States, and is now conservatively estimated to be worth \$25,000.



T. G. SETTLE, Chief Clerk.

The laboratory has been in successful operation for a year and a half, and is under the direction of a capable chemist, and saves to the farmers of the State each year more than the amount of the appropriation. Its equipment is estimated to be worth about \$1,000.

NET REVENUES OF DEPARTMENT.

From June 1, 1911, the date I took charge of the Department, there has been expended in the enforcement of the feed and seed laws, up to Dec. 31, 1914, the sum of \$29,768.50. This amount added to the two biennial appropriations, makes \$185,268.50. Deducting this amount from the total receipts of the Department for the same period, \$234,430.70, will leave \$49,162.20, which is net revenue from June 1, 1911, to date. Add to this amount the conservatively estimated value of the serum plant and the laboratory, \$26,000, and the estimated receipts of the Department to June 1, 1915, \$40,000, will give a net revenue to the State during my four years' term of office of approximately \$115,000.

Below are statements of the funds appropriated from the Treasury and expended under the direction of this Department:

INSTITUTE.

Biennial appropriaion	\$10,000.00
Expended	9,370.95
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Balance in Treasury	\$ 629.05

OFFICE EXPENSE.

Biennial appropriation	\$ 6,000.00
Expended	4,264.06
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Balance in Treasury	\$ 1,735.94

FERTILIZER INSPECTION AND TAGS.

Biennial appropriation	\$ 2,000.00
Expended	2,000.00
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ENTOMOLOGY.

Biennial appropriation	\$ 9,000.00
Expended	8,425.84
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Balance in Treasury	\$ 574.16

APIARY INSPECTION.

Biennial appropriation	\$ 3,000.00
Expended	2,711.88
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Balance in Treasury	\$ 288.12

BUREAU OF IMMIGRATION.

Biennial appropriation	\$ 7,200.00
Expended	4,965.48
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Balance in Treasury	\$ 2,234.52

LABORATORY.

Biennial appropriation	\$ 7,000.00
Expended	6,168.88
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Balance in Treasury	\$ 831.12

The financial statement of the State Veterinarian, including the operations of the anti-hog cholera serum plant, will be found in his report, which appears elsewhere.

AGRICULTURAL DEVELOPMENT.

During the past two years, the Department of Agriculture, in addition to the executive work in enforcing the agricultural laws, has lost no opportunity to encourage agricultural development in the State.

We have recognized the fact that it is the small farmers who collectively cultivate the largest area of our farm land. Our work has been along lines that would secure their interest and cooperation.

In the past, while valuable facts have been established, they have been presented to the farmers with suggested application for farm practice in such way that only the best equipped farmers could avail themselves of the information; the suggestions have been beyond the small farmers. We have taken the facts that the farmers should know and have presented them to the small farmers, with suggestions for their use that enabled them to put in practice on their farms with the equipment they could afford to own and operate. Dissemination of this information has been a large portion of our work, and we have had the full cooperation of both the newspapers and the railroads of the State. The newspapers without regard to politics have published our weekly "Talks to Farmers" and other special information for their benefit. We have found that the farmer reads his home

paper. They have read "Talks to Farmers," and thousands have written the Department concerning subjects discussed and have put in practice the suggestions offered. Through the newspapers the Department has gotten in close personal touch with the farmers who need help and are now anxious to build up the fertility of their soils, use better seeds and better cultural methods, and are willing to work together to produce quantity and quality to meet the demands of the dealers and consumers.

COOPERATION OF RAILROADS.

The railroads operating in Tennessee have cooperated with the Department in the most practical and liberal way. They have furnished transportation to farmers' meetings, operated the agricultural demonstration train, have kept hundreds of farm demonstrators in the fields with the farmers, helping them to improve their soils, their cultural methods, showing them how to prepare their products for market and helping them to find profitable markets.

The Nashville, Chattanooga & St. Louis Railway has been establishing demonstration farms in the different counties along its line. These farms were typical of the average farms surrounding them, and were equipped and operated within the reach of the average farmer to equip and operate his farm. Those established long enough have shown increased fertility and increased production, and that, too, without doing anything impractical for the average farmer to do. This work by this railway company will be of great practical benefit to the farmers along its lines.

The management of the railroads are doing their work for agriculture as a sound, progressive business proposition and not, as charged by demagogues, to blind the eyes of farmers to their oppression. The management of the railroads are dependent upon tonnage and passenger travel for their business, and they know that a prosperous citizenship along their lines means increased tonnage and travel for them. They have too much business judgment to "kill the goose that lays the golden egg," because a policy that would handicap the farmer would be reducing their revenues. We can far better dispense with the interference and meddling of the demagogue and politician than we can with the sensible, helpful cooperation of the railroads.

DIVERSIFICATION OF CROPS.

Since the outbreak of the European war the Department of Agriculture has been active in a campaign with the farmers in getting them to understand the changed conditions confronting them because



Part of Force Accompanying the Agricultural Special.

of the war, and to adjust their farm policies to profit by the increased demand for food products. We have at all times emphasized the importance of diversification of crops and the necessity for producing on the farm the products consumed there, keeping as much of the money at home as possible.

In Tennessee we are better prepared for the present emergency than almost any other Southern State because of the diversification of our crops. The one-crop farmer and his advancing merchant are both in hard luck because, with such a system of farming, the farmer is in debt for his crop when he gathers it. With the cotton crop as now selling at half price, at best he can only pay one-half of his indebtedness, leaving the advancing merchant unable to furnish the supplies necessary for him to make another crop. Tennessee farmers can produce food products for which there will be a ready sale at good prices as soon as they are ready for market. If we can get our farmers to form community organizations and cooperate in growing the crops for market best suited for their soils, and for which there is an assured market demand, their combined products will make shipments of sufficient quantity to secure the best prices if they will work together in producing uniform quality.

COMMUNITY COOPERATION.

Believing that community cooperation is the first essential towards improving the agricultural interests of the State, I have tried to emphasize this work in every way possible for the past two years. I relieved the Assistant Commissioners for each division of the State from the inspection of fertilizers that they might give their entire time to institute work and developing community cooperation. I have insisted on individual work in the community. Their instructions were to select two communities in each county, go into those communities, define their boundaries, make a list of the farmers and then by personal effort with the leaders in the communities get them to understand the value to them in working together to solve their local problems; and when they were sufficiently aroused, get a meeting of the citizens of the community and perfect an organization and keep in touch with it until it had realized the benefits to them of working as a unit on local problems.

Their reports as to the detail of their work are attached hereto.

FARM DEMONSTRATION.

Since I have been connected with the Department of Agriculture I have emphasized the importance of farm demonstration work be-

cause I realize that farmers are more impressed with what they see of a practical nature than they are with what they hear. Then I am convinced that the reason no more headway has been made in better agriculture in the past is in the fact that effort has been directed toward and for the benefit of the progressive farmer rather than the backward and indifferent farmer, and on a plane entirely out of the latter's reach.

We need the experiment stations to develop facts, but the backward farmer should not try to follow the detail of the experiments, but after the facts are proven, then, on a farm that is typical of the average farm, with equipment the average farmer can afford to own



Building Erected by East Tennessee Farmers' Institute.

and operate, demonstrate the facts to the farmers. Show them how they can make better crops and improve their own land with the equipment they can afford. I have heard hundreds of small farmers, when some progressive and prosperous farmer makes a large yield on rich land with expensive equipment, say, "Oh, yes, give me such land and such equipment, and I could do big things too." If we do not want to discourage the small farmer, we must suggest such practical things as he can do on his land with equipment that he can afford to own and operate, and it is better still to show him by practical demonstration than to tell him.

I am gratified to report that practical headway is being made in such practical farm demonstration work along the lines I have been

advocating. The Nashville, Chattanooga and St. Louis Railway has operated a farm such as I have described at Tullahoma the past season and did nothing on that land that neighboring farmers could not do. They were offered one thousand dollars for the tobacco on a nine-acre field. They also produced an unusually large yield of corn in a field adjoining. Their demonstration work has yielded a profit, to say nothing of its educational value. They have purchased a demonstration farm at Dickson, and have announced that they expect to have one in every county traversed by their road. If other roads in the State could be induced to follow their example, and the State Department and College of Agriculture would cooperate with them, a long step would be made towards better agriculture in Tennessee.

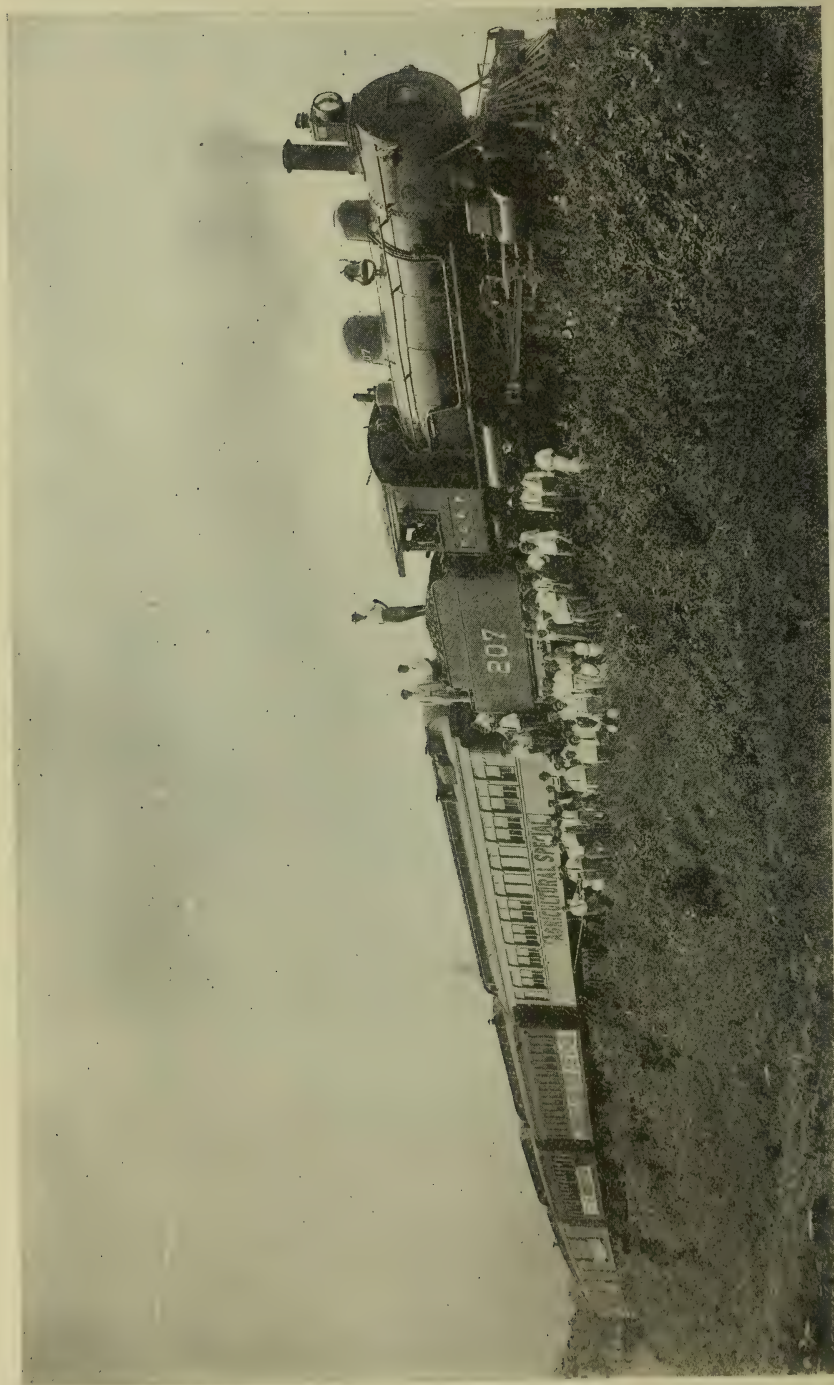
INSTITUTE WORK.

In view of the fact that the "Lever Bill" has become effective, and after the initial \$10,000 annually appropriated, additional appropriations must be supplemented by like amounts by the States participating, I recommend that the \$5,000 appropriated annually to the Department of Agriculture for institute work be appropriated to the College of Agriculture for institute and extension work. This will give that institution a working fund of \$20,000 annually for this specific work. I also recommend that in this work officials of the Department of Agriculture be given places on the programs of farmers' meetings because I have found an educational campaign conducted with the farmers one of the most effective means of acquainting them with the provisions of the agricultural laws and securing their cooperation in their strict enforcement.

Those who have the enforcement of the agricultural laws in charge must be directly in touch with the farmers, and I would regret very much to see the officials and the farmers in less close touch. There have been suggestions made by partisans that the institute work should be taken from the Department and placed solely with the College of Agriculture. I think the closest relations should exist between the Department and the College of Agriculture. Each has its own specific work, and this work should not interfere with, but strengthen the other. The Department has worked, since I have been at its head, never to interfere, but in every way we could to help and encourage interest in the College of Agriculture.

DIVISION INSTITUTES.

During the biennial period covered by this report, the Department of Agriculture, in using the appropriation of \$10,000 for institute work,



The Agricultural Special Train.

has endeavored to expend it in such manner as to reach the greatest number of farmers with lessons of better farming and to do the greatest good to the greatest number. For this reason, as stated elsewhere in this report, part of this sum was used in defraying the expenses of equipping the agricultural special train.

The balance of the fund for institute work was expended in reaching those parts of the State not touched by railroads and in defraying the expenses of division institutes.

In May of each year the East Tennessee Division Institute holds its annual session in a building erected by the members on the Experiment Station farm at Knoxville. In 1913 and 1914 most interesting meetings of the East Tennessee institute were held at Knoxville and, as usual, were largely attended. Interesting programs were presented.

The meetings of the West Tennessee institute are held in Jackson, in September of each year, and the meetings in 1913 and 1914 were largely attended by West Tennessee farmers.

The Middle Tennessee Institute holds its session at Nashville, at the State Fair Grounds, in October of each year, and the 1913 and 1914 meetings were largely attended and showed increased interest in progressive farming by the farmers of Middle Tennessee.

Full accounts of the meetings of the division institutes are published in the monthly bulletin, and will be bound in with this report when printed.

THE AGRICULTURAL SPECIAL TRAIN.

In order to carry to the farmers of Tennessee, as directly as possible, the valuable information which has been worked out by the College of Agriculture and Experiment Station, the Department of Agriculture and other agencies at work for better farming, this Department believed that one of the best methods to do this would be the operation of an agricultural special train, reaching farmers on every line of railroad operating in the State.

With this end in view the Department opened negotiations with the railroads in the State, and found that every one doing business in the State was heartily in favor of the operation of a special train for this purpose. The roads cooperating with the Department this year were the Nashville, Chattanooga & St. Louis, the Louisville & Nashville, Southern Railway and allied lines, Tennessee Central, the Illinois Central, Mobile & Ohio, the Cincinnati, New Orleans & Texas Pacific, the Birmingham & Northwestern, the Knoxville, Sevierville & Eastern, the Carolina, Clinchfield & Ohio, and the Tennessee, Kentucky & Northern.

The Department of Agriculture spared no effort in fitting out the train to be an object lesson to the farmers of the State in better farming, live stock breeding, dairying, etc., and to show to the farmers' wives and daughters the best that there is in housekeeping and making the farm home attractive. Each car was in charge of a trained lecturer, and an abundance of literature was on hand for free distribution on all subjects of interest to the farmer and his family.

The train consisted of nine cars—the farm crops car, the fruits, vegetables and apiary car, the live stock car, the health car, educational car, domestic science and dairy car, platform car for speaking and machinery demonstration, dining car, and sleeping car. The train was



Agricultural Special on Illinois Central R. R.

operated from July 15 to September 17, inclusive, with the exception of Sundays. It is estimated that during that time the train traveled over 10,000 miles, made about 350 stops, and the exhibits were seen and lectures heard by more than 500,000 people.

I have never seen anywhere people more interested or more eager for information. While we worked daily from 4 o'clock in the morning until 10 o'clock at night for practically nine weeks, we could not reach all places where we were petitioned to stop, and could not stay as long as we wanted and should have stayed, and I am sure that the only criticism that might be made of the train was because of the short time spent at the different stops and the haste necessary to get the crowds through in the scheduled time. This we regretted more

than the people, but when it is remembered that the work was a voluntary movement undertaken by the railroads and the Agricultural Department forces, the latter devoting much extra time without additional compensation, I think that every fair-minded person will forego any criticism for the hurry which was imperative and unavoidable.

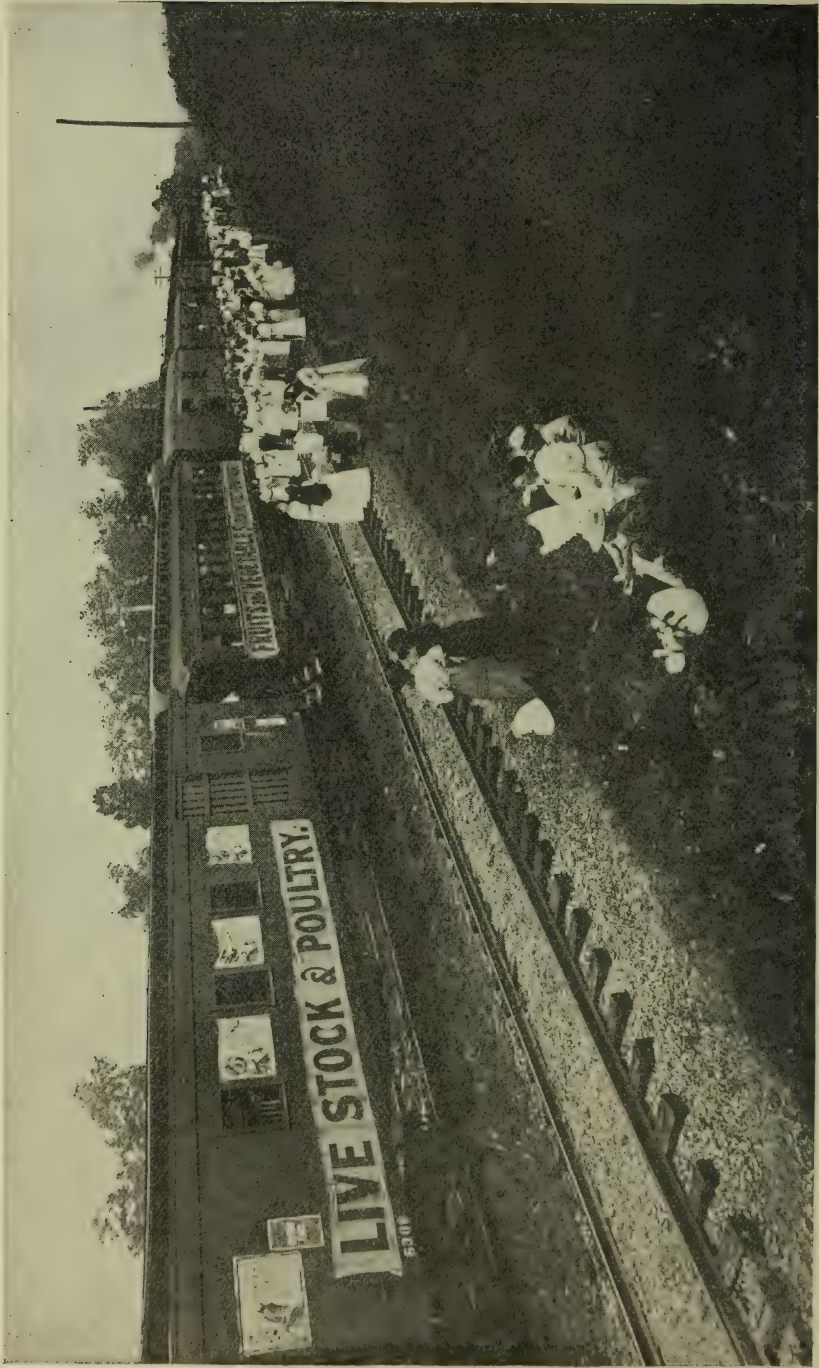
The movement was planned and executed without one additional cent of expense to the taxpayers of the State over and above that which is expended during the time in institute work. This was made possible by the broad, cooperative and progressive business policy of the railroads operating in Tennessee. Knowing that the departments cooperating in the movement—that is, the Department of Agriculture, Department of Health, Department of Education and the Food and Drugs Department—had no available funds for such work, every railroad company operating in Tennessee cheerfully cooperated by furnishing cars, and each road, when the train reached its line, furnished the engine and train crew, and sometimes trainmaster and division superintendent, to accompany the special. The Nashville, Chattanooga & St. Louis Railway furnished the sleeping and dining cars, both completely equipped in every way, and a part of the time a gondola car for carrying limestone rock for pulverizing demonstrations.

All this cooperation of the railroads of Tennessee was given without one cent of compensation. Their action was without sentimental reasons more than any individual could have, but rather a broad-minded business policy, they recognizing the fact that if the people along their lines were stimulated to better methods in farming the result would be greater production, and consequently greater prosperity for the farmers, and the railroads would necessarily share in that prosperity.

I believe that the agricultural special will result in great benefit to the farmers of the State, and that the time spent in preparation and given to it on the road by the officials of the departments cooperating was time well spent.

TALKS TO FARMERS.

Soon after I assumed the position of Commissioner of Agriculture I began furnishing copy to the newspapers every week entitled, "Talks to Farmers." This has been continued every week to the present time, and it is gratifying to note that practically all the papers in the State, without regard to their political affiliations, are using them. I do not regret the effort expended in their preparation, because in my contact with the farmers of the State hundreds have told me of the



Agricultural Special and Crowd.

value they have been to them. I have tried to discuss subjects that were timely and in such plain, simple and frank manner that any who could read them could understand and profit by them. I am deeply grateful to the newspapers of Tennessee for their liberal cooperation, for this is one feature of my work that I could not have carried on without their help. I hope this work will be continued.

PRINTING AND DISTRIBUTION OF LITERATURE.

As stated elsewhere in this report, one of the best means of reaching the farmers has been through the county papers of the State, and each week I have furnished to these newspapers weekly talks to farmers, which they have generously used and have been, I believe, productive of great good to the farmers.

Besides this the Department has continued the issuance each month of the bulletin, "Tennessee Agriculture," of from 32 to 64 pages, containing matters of interest to the farmers of the State, including the work of the various branches of the Department, and this bulletin has been distributed free of cost to the farmers of the State.

In 1913 the Department issued a new map of the State, including a soil or geological map, and this has been distributed both inside and outside of the State, but has been used principally in furthering the work of the Bureau of Immigration. It contains, besides the maps, a complete description of the State as a whole, by divisions and then by counties. This map is greatly in demand and the edition printed has been nearly all distributed.

During the biennial period another edition of "Facts About Tennessee," a handsomely illustrated little booklet descriptive of the State, was printed and distributed. This publication is also used principally in furthering the work of the Bureau of Immigration.

The State Veterinarian, in his work during the biennial period in eradicating contagious animal diseases and preventing their introduction into the State, has also printed a great deal of literature, and especially in the operation of the plant for the manufacture of anti-hog cholera serum. A report of this will be included in report of Dr. Geo. R. White, State Veterinarian, attached to this report.

IMMIGRATION.

During the past two years, after the meager appropriation for immigration became available, we have conducted an aggressive campaign for immigration in the Northern States, and have succeeded in bringing into Tennessee many families as permanent settlers, some going to the western division of the State, a few to the Middle Ten-

nessee basin, but the larger portion finding homes on the Cumberland Plateau. When we realize that little more than 25 per cent of our farming area is in cultivation, and when we compare the prices of land in Tennessee and the prices of land in some of the Northern States; when we realize that thousands of tenants are paying more as a yearly rental for land than it would cost them to buy land in Tennessee that can be developed into profitable property, we certainly should place the facts before those people and secure them as citizens.

The European war will bring to the United States many thousands



Machinery Car of Agricultural Special.

of immigrants. Our climate, our soil and annual rainfall should appeal to them, and will, if the Legislature makes it possible for the facts to be placed before them.

The report of J. J. B. Johnsonius, who, as Assistant Commissioner of Immigration, has been in active charge of the immigration work of the Department, appears elsewhere.

THE STATE FAIR.

The Legislature, acting upon my recommendation, very generously appropriated to the State Fair the amount necessary to care for the deficit that had accrued under the former management, and before the present Board of Fair Trustees had actually taken charge of the direct management of the State Fair, and for permanent improvements. For the year 1913, \$30,000 was appropriated, and \$10,000 for the year 1914.

After paying the deficit with accrued interest, and after making

several needed improvements, the State Fair grounds was visited by a destructive cyclone, which demolished the rear of the grandstand, unroofing one side, also doing very great damage to the Davidson County building and the agricultural building.

The damage was all gone over by the experts, contractors, etc. On account of the short time between the cyclone, July 31, 1913, and the giving of the 1913 fair, it was necessary to place these buildings in good repair and make them safe to house the exhibits and care for the people who would attend the fair. This work was rushed to completion, and the contractors generously waited for part of their pay until the appropriation from the State for 1914 was available.

These improvements have all been paid for and the additions to the grandstand were very much appreciated by the public. The damage done by the cyclone was estimated from \$11,000 to \$12,000.

Since the State Fair was inaugurated, some nine years ago, it has paid out in premiums \$250,000, the larger part of which sum has gone into the pockets of our farmers and live stock breeders. Nearly every feature of the State Fair is educational.

Expenses for 1913 Fair, including maintenance for year..	\$79,983 84
Receipts for 1913 Fair from all sources.....	72,278 18

Leaving a deficit of	\$ 7,705 66
Expenses for 1914 Fair, including maintenance for year..	\$59,589 77
Receipts for 1914 Fair from all sources.....	49,948 95

Leaving a deficit of	\$ 9,640 82
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The fair of 1913 surpassed any fair of former years, although the weather was unfavorable for attendance, which showed a small falling off over previous years.

The increased amount offered in premiums brought out fine exhibits in every department. The live stock, agricultural and horticultural displays ranked with the best State Fairs in the country.

Considerable improvements were made for the fair of 1914, which was pronounced by many competent judges and exhibitors as being the best fair ever held in the South, on account of its educational features and large exhibits.

The Trustees found it necessary to change the exhibit buildings that the displays might be shown to better advantage. The agricultural exhibit was held on the second floor of the grandstand, the Woman's exhibit in the second story of the agricultural building, the educational and children's exhibit on the lower floor of the Davidson

County building, and the electrical show on the lower floor of the agricultural building.

In order to make more convenient the fair of 1914, the larger beef breeds of cattle—Shorthorns, Herefords, Angus and Polled Durham—were transferred to the building formerly occupied by the poultry exhibit, and the poultry and pet stock to a building fitted up especially for the show.

The exhibit halls were crowded to their full capacity, and on all sides the management was congratulated upon the magnificent fair that had been staged. On account of the terrible drouth, the war and



Barns on Lespedeza Farm, Hickory Valley, Tenn.

general depression of business the attendance was not up to its usual standard. Rain on Nashville Day caused a heavy loss to the management.

The merchants of Nashville, who have always shown a spirit to aid the fair, in the absence of any funds to stage the fair of 1914, as the major part of the appropriation from the State for 1914 had to be used for improvements, guaranteed the amount necessary to carry the fair up to the opening of the gates. They borrowed \$7,500.00 from the Fourth and First National Bank of Nashville for this purpose. On account of the decreased attendance, this loss has to be cared for by the business men of Nashville.

I have said before, and repeat here, that our State should adopt some permanent policy for the State Fair—decide whether or not it

is wanted as a permanent State institution. If it is, then provide for it as other State institutions are provided for; give it something definite to build upon, that it may grow to meet the demands of such an institution, and keep pace with other State fairs in buildings, etc.

The fair, in point of exhibits, and educational value, has always been abreast of the best fairs in the country in spite of poorly equipped buildings and want of funds. Tennessee is one of the best States for agricultural pursuits, and needs such a clearing house for the progressive farmers and live stock growers.

THE FARMERS' EDUCATIONAL AND COOPERATIVE UNION.

For more than a year past I have been a member of The Farmers' Educational and Cooperative Union. I have had an opportunity to become familiar with its plans, purposes and accomplishments, and I am convinced that it is going to be the means of securing that cohesion among farmers in their efforts that will insure their permanent prosperity and the absence of this element of cohesion and cooperation in the past has been their greatest drawback.

The organization cannot fail in being of great service to the State while it adheres, as it now does, to its declaration of purpose, with a motto, "To Secure Equity, Establish Justice and Apply the Golden Rule," with seven declarations of purpose, which follow:

1. To discourage as much as possible the present credit and mortgage system.

2. To assist the members in buying and selling.

3. To teach the science of agriculture, diversified farming and the science of crop marketing.

4. To secure profitable and uniform prices for cotton, grain, live stock and other products of the farm.

5. To eliminate gambling and speculation in farm products by boards of trade, cotton exchanges and other speculators.

6. To form a closer union with those in authority that vice, crime and immorality may be suppressed.

7. We would garner the tears of the distressed, the sweat of honest labor, the laugh of innocent childhood, the blood of martyrs, the virtues of a happy home, the brightest jewels known.

There are 65 county unions, with approximately 1,800 locals, with a membership of 25,000, composed of the most progressive farmers in Tennessee. The organization has made great progress in the last year, adding 10 county unions, 200 locals and several thousand members.

There are 100 business enterprises in Tennessee owned and oper-



Cumberland County Potato Club Boys.

ated by this organization—cooperative stores, live stock associations, poultry associations, peanut recleaners, warehouses, lime crushers, three banks, one college, lamb clubs, creameries and dairies. The organization is educational, working hand in hand with the Agricultural Department, Agricultural College, farm demonstrators, boys' corn clubs, girls' tomato clubs, and every other factor that is trying to advance agricultural interests in the way of greater production and scientific marketing.

The organization is non-political, yet it is working for and expects the enactment of progressive legislation along educational and cooperative lines. The success of this organization undoubtedly means better roads, better schools, better farms, better farmers, happier homes and brighter firesides.

I have only spoken of the Tennessee Division, but the Union is a national organization, reaching from Virginia to Texas, Alaska to Florida, with local unions in every State south of Maryland and west of Ohio, with 23 chartered States, all of these States working in harmony for better conditions for the American farmer and brighter days for the American agriculturist.

I think it is but justice to the unselfish leaders of this great Union, who are laboring so earnestly for the betterment of our agricultural classes, that all our people should know more of this splendid work in the interest of better agricultural conditions in Tennessee.

CONCLUSION.

In making this report at the close of your administration I want to thank you for the confidence imposed by your selection of me as the head of this important Department of the State Government, and to express to you my appreciation for your valuable cooperation in the work undertaken. I have done the best I could to make the Department of Agriculture serve fully the purposes for which it was created. I have been familiar with your plans and policies for the conduct of the State's business, and I know that you have assumed the same attitude towards every Department of the State Government—that it should serve fully the purposes for which it was created—and I am sure that you can feel that you have been faithful to the trust imposed upon you, and your administration will be written in history as one of the best the State has ever had.

Respectfully submitted,

T. F. PECK,
Commissioner.



DR. GEORGE R. WHITE, State Veterinarian.

BIENNIAL REPORT OF STATE VETERINARIAN.

Hon. Thos. F. Peck, Commissioner of Agriculture of Tennessee:

SIR: I have at this time the honor as well as the pleasure of submitting this, the second, biennial report as State Veterinarian, as provided by law. Since submitting my last report much has transpired pertaining to live stock sanitary control work in Tennessee which should be known to yourself and his excellency, the Governor, as well as every good citizen of the commonwealth.

As a general proposition, contagious diseases among animals in the State have been either entirely eradicated or kept under control. I believe conditions in Tennessee would justify even the statement that all contagious and infectious diseases have either been entirely eradicated or their ravages considerably and perceptibly curtailed. I know of no animal disease which has spread or become more prevalent during the past two years. Since the completion of tick eradication work the cattle raising industry has been materially stimulated, and we know that more cattle and a better grade of cattle are now being raised in Tennessee than ever before. As a direct result of serum treatment the swine raising industry has received a considerable stimulus, and many persons who were formerly deterred from engaging in swine raising are now growing hogs on a large scale.

The high prices of all classes of live stock, with the single exception of mules, have been an incentive to our people to produce them.

NUMBER AND VALUE OF LIVE STOCK IN TENNESSEE ACCORDING TO
FEDERAL CENSUS OF 1910.

The live stock industry of Tennessee represents an investment of over one hundred and six million dollars, distributed as follows:

	Number.	Value.
Cattle	994,941	\$20,654,743
Horses and colts	349,145	39,257,892
Mules and mule colts	275,000	35,060,075
Asses and burros	7,983	1,074,816
Swine	1,386,050	7,320,377
Sheep and lambs	793,963	3,005,538
Goats and kids	43,493	82,553

There is little or no doubt that since 1910 the number as well as value of live stock in Tennessee has increased considerably. A con-

servative estimate would indicate that at least one-fourth could be added to the above figures.

ANIMAL DISEASE COSTS MILLIONS ANNUALLY IN UNITED STATES.

The Federal Government has already paid out more than half a million dollars in the various States to the owners of cattle that have been killed in order to prevent the spread of foot and mouth disease. The States have contributed another half million, bringing the total sum paid out up to the million dollar mark. This, of course, only refers to the amount paid to farmers, but it does not represent their loss. Where pure-bred herds were involved the remuneration received by the owners was but nominal, while in no case could it be said that the owner received full value for the animals slaughtered. In many cases breeding herds were swept away, though the animals were valued only at what they were worth for meat. It can be easily understood that in the case of good dairy cows the amount paid to the owner would fall far short of covering his loss.

Then there is a quarter of a million dollars additional that has been paid out for salaries of men engaged in fighting the disease, for disinfectants, for labor and for transportation, and, of course, the end is not yet in sight, because many counties in several States are still operating under strict quarantine rules.

The expenditure for stamping out foot and mouth disease, which has already cost between one and two million dollars, is, after all, an infinitesimal matter compared with the total annual loss from animal diseases in this country. The Federal Government estimates this at \$212,000,000.

Texas fever and cattle ticks, against which the government is conducting a vigorous campaign, cause a loss of \$40,000,000 a year. Tuberculosis of cattle and other stock comes next, with a loss of \$25,000,000; contagious abortion, \$20,000,000, anthrax, \$1,500,000; scabies of sheep and cattle, \$4,600,000; black leg, \$6,000,000; glanders, \$5,000,000; other diseases of live stock, \$22,000,000; parasites, \$7,000,000, and poultry diseases more than \$8,750,000, making a total of exactly \$212,850,000 lost by live stock and poultry raisers each year due to various diseases, a large number of which are known to be preventable.

FINANCIAL STATEMENT.

Following is financial statement of Live Stock Department from December 20, 1912, to December 20, 1914:

Biennial appropriation 1913 General Assembly.....	\$10,000.00
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Total expenditures for live stock sanitary control work, which includes salaries of assistants and their expenses, office expense, which includes stamps, stationery, telegraphing, expressage, freight, drayage and publications of the Department (vouchers for which may be found in office of Comptroller)	9,280.72
Traveling expenses of State Veterinarian	719.28

\$10,000.00

ATTITUDE OF LIVE STOCK OWNERS.

That my efforts thus far in protecting the live stock of this State from disease, and stamping out those contagious diseases already in



Crowd at Agricultural Special. Demonstration of Hog Cholera Serum Treatment.

our midst, are appreciated, is shown by the friendly attitude of the live stock owners themselves. Several distinct reforms in the methods of conducting live stock sanitary control work in this State have been already instituted.

At first efficient work by this Department was greatly handicapped for lack of practical rules and regulations by which outbreaks could be satisfactorily controlled. The rules and regulations formerly in vogue were antiquated and inefficient in the control, suppression and eradication of contagious and infectious animal diseases along scientific lines, and in accordance with modern methods.

SPECIAL ORDERS PROMULGATED.

By virtue of the authority conferred upon the Commissioner of Agriculture and State Veterinarian by Acts of Tennessee 1901, 1907, 1909 and 1913, the following special orders have been promulgated since last report:

OFFICIAL ORDER No. 18.

EFFECTIVE ON AND AFTER JULY 5, 1914.

Whereas, we have been requested to waive dipping provision of Special Quarantine Rules and Regulations promulgated May 1, 1913, and effective May 10, 1913, in order to facilitate handling Tennessee owned horses for exhibition and racing purposes at the Bartow County Fair, which will be held October 20, 21, 22 and 23, 1914, at Cartersville, Ga., and since we have been assured by the County, State and Federal officials, as well as the Bartow County Fair Association through its Secretary, B. C. Sloan, that the animals while there will be protected from Texas fever tick infestation;

Now, therefore, we, T. F. Peck, Commissioner of Agriculture, and G. R. White, State Veterinarian, do hereby waive dipping provisions of Tennessee Regulations for the purpose outlined above, provided, however, that at close of this exhibition the railroads shall not accept any horses destined to any part of Tennessee unless and until they are carefully inspected by an authorized State or Federal Government inspector and are found free from ticks, which fact must be certified in writing by the official making the inspection. Said certificate shall be made in duplicate, one copy to be attached to the way bill and the other copy to be mailed promptly to the State Veterinarian, Nashville, Tennessee.

Given under our hands and seal, at State Capitol, this July 1, 1914.

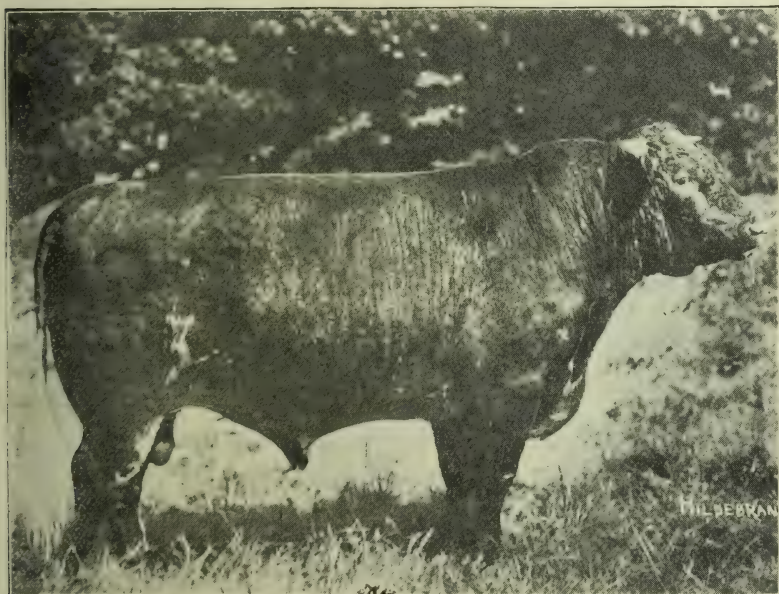
OFFICIAL ORDER No. 19.

EFFECTIVE ON AND AFTER JULY 10, 1914.

Whereas, the fact has been determined by the Commissioner of Agriculture and the State Veterinarian, and notice is hereby given that a contagious, infectious and communicable disease known as hog cholera is prevalent and widespread among the swine herds of every county in Tennessee and every State in the United States, with the exception of Maury County, therefore, we here and now declare Maury County free from hog cholera infection and in order to protect the swine in said county do hereby promulgate this, A QUARANTINE ORDER against every other county in Tennessee, and every

State in the United States, and it is our order that no swine shall be shipped, driven, hauled or otherwise moved or transported or allowed to drift into Maury County for breeding, feeding, pasturing or any other purpose from any county in Tennessee or any other State in the United States, except in accordance with this Official Order.

Whereas, the work of hog cholera eradication in the County of Maury has been undertaken by the State and County in cooperation with the Federal Government, and whereas, to get results commensurate with the financial expenditure involved, demands that prompt



Shorthorn Bull.

and heroic measures be adopted in the form of Rules and Regulations governing the work.

Now, therefore, we, T. F. Peck, Commissioner of Agriculture, and G. R. White, State Veterinarian, do hereby order:

SECTION 1. Whenever hog cholera develops on any farm or other premise in Maury County, the State Veterinarian or his Assistant or the County Live Stock Inspector shall placard said premise with a red card upon which is printed the words: "HOG CHOLERA ON THESE PREMISES—KEEP OUT." Whosoever disregards this warning shall subject themselves to having their own premises quarantined for a period of *ninety* days or longer as subsequent developments may demand.

SEC. 2. The following shall constitute the official quarantine blank which shall be used during the progress of this work:

ANIMAL AND PREMISE QUARANTINE ORDER.

Mr.,

P. O. Address

District No., Maury County, State of Tennessee.

You are hereby officially notified that the swine on your premises, described as follows: are infected with or exposed to hog cholera, a contagious, infectious or communicable disease, and you are hereby ordered to remove said diseased swine from the premises described above and confine them on premises described as follows: where they shall be retained for a period of ninety days or until released by written order of the State Veterinarian. You are further ordered to keep animals of every species off the premises from which diseased swine have been removed for a period of *ninety days* unless otherwise ordered.

It is further ordered that you clean up and disinfect your premises according to the Rules and Regulations promulgated by the Commissioner of Agriculture and State Veterinarian, known as Official Order No. 19, which became effective July 10, 1914, a copy of which is hereby furnished you. It is further ordered that all dead carcasses now on your premises and carcasses of all animals which may die or be destroyed from any cause be *burned* to ashes within twenty-four hours after death occurs.

G. R. WHITE, M.D., D.V.S.,

State Veterinarian.

Original—To be delivered to owner.

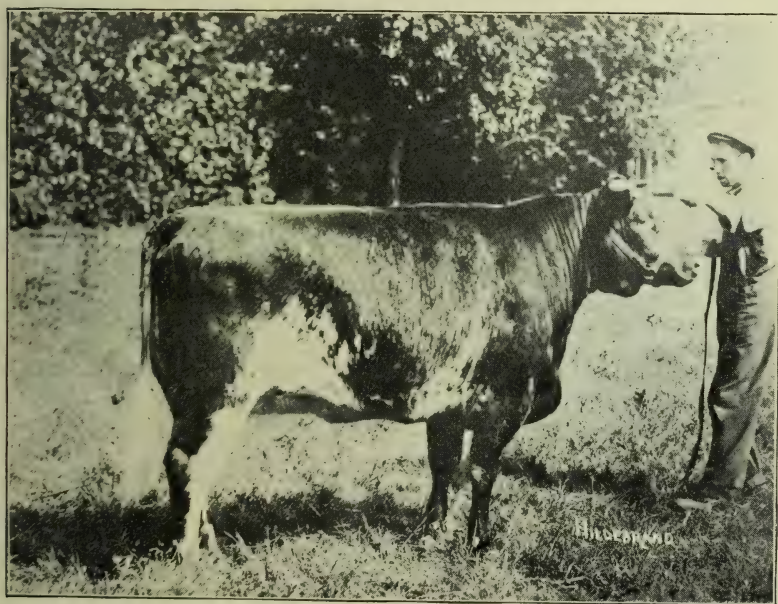
Duplicate—To be kept on file.

SEC. 3.—The owner or person in charge of animals which die in the County of Maury must dispose of the carcasses thereof by burning to ashes within twenty-four hours after death, and hogs infected with or exposed to cholera shall not be driven on public roads, commons or ranges. Such hogs must be confined in strict quarantine.

SEC. 4. Cresol Compound, U. S. P., is hereby recognized as the standard disinfectant for premises, cars or other vehicles used in the transportation of diseased swine. Also for disinfecting hogs to eliminate cholera infection. No other disinfectant or antiseptic will be recognized during the progress of this work.

SEC. 5. All wagons, railroad cars and other vehicles; all pens, chutes, lots, barns and runways which have contained hogs diseased from cholera, or which have been exposed to the infection of hog cholera by having contained material known to have been contaminated with hog cholera shall be cleaned and disinfected in the following manner:

First—Remove all litter, refuse and manure from infected area and thoroughly saturate the exposed surfaces, including the walls, floors, fences and troughs, with a solution made with four (4) ounces of Cresol Compound, U. S. P., to each gallon of water, to which has



Shorthorn Heifer.

been added sufficient lime—not to exceed one and one-half pounds to a gallon—for the purpose of showing where the solution has been applied.

Second—All removed litter and refuse shall be burned to ashes by fire, or it may be thoroughly mixed with air-slaked lime, sprinkled with a 3 per cent solution of Cresol Compound, U. S. P., after which it shall be hauled out and plowed under in a field, and susceptible hogs shall not have access to this field for a period of ninety days.

Third—When considered advisable by the officials in charge of this work, they shall have power and authority to order infected or

exposed hogs to be disinfected with a 2 per cent solution Cresol Compound, U. S. P.

Fourth—The cleaning and disinfection shall be done under the direct supervision of the State Veterinarian or his duly appointed assistant, or by an authorized county live stock inspector.

SEC. 6. Each lot or shipment of hogs moved by rail, wagon or other conveyance or on foot, or moved in any manner, into Maury County, for feeding, breeding, pasturing or other purposes must be accompanied by a certificate of health issued by a duly authorized State or Federal official stating that they have been immunized by the Dorset-Niles Serum method, and that they have been held fourteen days after being thus immunized and have been disinfected with a 2 per cent solution Cresol Compound, U. S. P.

All health certificates shall be made in triplicate, one copy of which shall be sent to the State Veterinarian in Nashville, one copy to the U. S. Veterinary Inspector in charge at Columbia, and one copy attached to the way bill (to accompany the shipment).

SEC. 7. Hogs destined for "immediate slaughter" may be brought into Maury County provided they are unloaded directly into properly quarantined slaughter pens or hauled by wagons to such pens, and must be slaughtered within forty-eight hours after unloading. All wagons and other vehicles which have carried hogs for immediate slaughter shall be cleaned and disinfected with a 3 per cent solution Cresol Compound, U. S. P., immediately after unloading.

SEC. 8. All public stock yards are hereby declared infected and hogs yarded therein shall not be removed except for immediate slaughter, or after having complied with the rules and regulations governing the importation of swine as provided in Section 6.

SEC. 9. All railroad cars carrying live stock into Maury County from any point outside of the county shall be cleaned and disinfected within twenty-four hours before said live stock is loaded. Said cleaning and disinfecting consists of removal of all litter from the car and thoroughly saturating the floor and sides with a 3 per cent solution Cresol Compound, U. S. P., to which has been added sufficient lime to show where the solution has been applied.

Given under our hands and seal at State Capitol, this July 5, 1914.

AMENDMENT TO OFFICIAL ORDER NUMBER 19.

EFFECTIVE ON AND AFTER DECEMBER 10, 1914.

We, T. F. Peck, Commissioner of Agriculture, and G. R. White,

State Veterinarian, hereby give notice that Section 4 of Official Order No. 19, promulgated July 5, 1914, and effective July 10, 1914, is hereby amended so as to read as follows:

"SECTION 4. Cresol Compound, U. S. P., is hereby recognized as the standard disinfectant for premises, cars and other vehicles used in the transportation of diseased swine. Also for disinfecting hogs to eliminate cholera infection. No other disinfectant or antiseptic will be recognized during the progress of this work.

"Said cleansing and disinfection shall be done under the direct supervision of the State Veterinarian or his duly appointed assistant, or an authorized county live stock inspector, and shall have been completed not later than twenty-one days after hog cholera infection has been found to exist on the premises."

Given under our hands and seal at State Capitol, this December 7, 1914.

OFFICIAL ORDER NO. 20.

EFFECTIVE ON AND AFTER SEPTEMBER 29, 1914.

SECTION 1. Notice is hereby given that all outstanding virus permits beginning with number 1 and ending with number 8,000 are hereby extended for a period of twelve months from date. All holders of virus permits, swine owners, and other persons are advised to govern themselves accordingly.

Given under our hands and seal at State Capitol, this September 29, 1914.

OFFICIAL ORDER NO. 21.

EFFECTIVE ON AND AFTER NOVEMBER 6, 1914.

SECTION 1. Beginning immediately and continuing until this order is either modified or revoked, all cattle and sheep coming into the Union Stocks Yards, Nashville, Tennessee, will be detained until they are inspected and passed by either a Federal or State live stock inspector.

Given under our hands and seat, at State Capitol, this November 6, 1914.

OFFICIAL ORDER NO. 22.

EFFECTIVE ON AND AFTER NOVEMBER 12, 1914.

The fact has been determined by the Commissioner of Agriculture and State Veterinarian, and notice is hereby given that a contagious, communicable or infectious disease known as European Foot and Mouth Disease, has made its appearance in this country, and at this time is known to exist in no less than 14 States.

The further fact has been determined and notice is hereby given that shipments of cattle, sheep and swine from the Chicago Union Stock Yards since October 1 have not only spread the disease in question, but have infected or contaminated live stock cars and public stock yards used in their transportation.

Now, therefore, we, T. F. Peck, Commissioner of Agriculture, and G. R. White, State Veterinarian, do hereby order:

SECTION 1. That owners, proprietors or other persons in charge of public stock yards in Tennessee cause same to be cleaned and disinfected within 5 days after receipt of this order, as follows:

(a) Remove all accumulations of manure, dirt and other filth by scraping down to the solid earth.

(b) If woodwork has become decayed, porous or absorbent, same to be removed and replaced with new material.

(c) Sweep down side walls, stall partitions, floors and other surfaces until free from cobwebs, dirt and dust.

(d) After cleaning all floors, side walls and feed troughs of pens, alleyways and stalls shall be disinfected with Cresol Compound, U. S. P., in the strength of 4 ozs. to each gallon of water, to which has been added a sufficient quantity of lime to indicate where it has been sprinkled or sprayed.

SEC. 2. That a failure to comply with the provisions of this order will subject such public stock yard to rigid quarantine until such time as its provisions are complied with.

Given under our hands and seal, at State Capitol, this November 12, 1914.

OFFICIAL ORDER No. 23.

EFFECTIVE ON AND AFTER DECEMBER 15, 1914.

The fact has been determined by the Commissioner of Agriculture and State Veterinarian, and notice is hereby given that a contagious, communicable or infectious disease known as European Foot and Mouth Disease has made its appearance in this country, and at the present time is known to exist in no less than seventeen States.

Now, therefore, we, T. F. Peck, Commissioner of Agriculture, and G. R. White, State Veterinarian, do hereby order:

DISINFECTED CARS.

SECTION 1. No cattle, sheep, goats or swine shall be transported by rail or boat destined to any point in Tennessee from other States unless same are carried in cleaned and disinfected cars or boats. Said disinfection to be done under official supervision in accordance with

Federal Government Rules and Regulations providing for the cleaning and disinfection of live stock cars.

No straw or hay will be permitted in bedding the cars and boats, and they must bear official tag signed and attached by an authorized Federal or State inspector showing that same have been disinfected since being used for the transportation of live stock.

No cars or immigrant movables, containing cattle, sheep, goats or swine, or hay, grain or other fodder, shall be moved into the State of Tennessee unless both car and feed have been thoroughly disinfected prior to shipment and the car tagged by an authorized Federal or State inspector showing date of such disinfection.

All cars used for the transportation of live stock within this State must be thoroughly disinfected according to Federal Government re-



Junior Herd Shorthorns, Lapedeza Farm.

quirements before same are loaded with any cattle, sheep, goats or swine for transportation to points within this State or to be moved out of the State, and said cars must be tagged by the inspector supervising such cleansing and disinfection and showing the date thereof.

HEALTH CERTIFICATES.

SEC. 2. All shipments of live stock from other States into the State of Tennessee must be accompanied by health certificates certifying that said animals are free from contagious, infectious or communicable diseases, and that they have not been exposed directly or indirectly to European foot and mouth disease infection.

PURPOSE FOR WHICH CATTLE, SHEEP, GOATS AND SWINE MAY BE MOVED
INTO TENNESSEE.

SEC. 3. The movement of all cattle, sheep, goats and swine from other States into the State of Tennessee shall be for purpose of immediate slaughter only and shall be destined to points in Tennessee having facilities for such handling.

DISPOSITION FROM PUBLIC STOCK YARDS IN TENNESSEE.

SEC. 4. Whenever cattle, sheep, goats and swine from Tennessee points reach public stock yards in this State they must be disposed of for purpose of immediate slaughter, or they may be consigned to other States in accordance with requirements of State of destination.

Before horses and mules are permitted to be removed from public stock yards in Tennessee to points within the State their feet and legs shall be thoroughly washed with Cresol Compound, U. S. P., in the strength of 2 1-2 ounces to each gallon of water. Said disinfection must be done under official supervision.

PURPOSE OF ORDER.

SEC. 5. It is the purpose of this order to prohibit the movement of cattle, sheep, goats and swine from other States into the State of Tennessee for any purpose other than immediate slaughter, and it is the further purpose of the order to prohibit the movement of cattle, sheep, goats and swine from public yards in this State for dairy, breeding and feeding purposes, and to provide that all cars used in the transportation of animals from other States into the State of Tennessee and for all movements of animals from one point in Tennessee to another point within the State shall be cleaned and disinfected previous to loading.

Given under our hands and seal, at State Capitol, this December 9, 1914.

HOG CHOLERA.

Since my last biennial report Tennessee has rapidly forged to the forefront in hog cholera control work. The last General Assembly in their wisdom saw fit to provide an appropriation of \$10,000.00 toward establishing and equipping a serum plant. This appropriation was not available until about October 15, 1913, and on November 1, 1913, the plant was in operation supplying the swine owners of Tennessee with serum for the treatment of their herds at actual cost of production.

The cost of this plant and its equipment exceeded the appropriation by \$4,300.00. From it 3,359,425 cubic centimeters of serum have been

distributed. For the most part satisfactory results have been attained. In a few instances mistakes on the part of owners and others in administration have been made. So far as I know, only one batch of impotent serum has managed to get through the plant, and this happened during the time (five weeks) the State Veterinarian was out of Tennessee endeavoring to prevent the introduction of European foot and mouth disease. Some hogs were lost as a consequence of this serum.

I have endeavored at all times to keep competent and qualified men in the plant, and have for the greater portion of the time succeeded. As to the supervision of the actual details of the work at the plant, the State Veterinarian has had to depend entirely upon others, as his multiplicity of duties requires most of his attention elsewhere. In only one instance has his confidence in employes been abused, and in this case action was promptly taken.

COOPERATION WITH THE FEDERAL GOVERNMENT IN HOG CHOLERA
ERADICATION WORK.

Less than one year ago Congress appropriated \$500,000 for hog cholera work, the appropriation to be used as follows: \$50,000 for supervision of commercial serum plant doing an interstate business, \$150,000 for cooperating with States in handling hog cholera in a general way, \$300,000 for purpose of cooperating with 15 States in eradication of hog cholera from one county in each State.

Tennessee is one of the States which was successful in securing this government aid. Maury County was selected for this demonstration work by the Commissioner of Agriculture of Tennessee and the Secretary of Agriculture of the United States. The work in Maury County started July 1, 1914, with Dr. J. P. Conner in charge for the United States, and Dr. C. E. Kord representing the State. This work has progressed satisfactorily, as the following report of Dr. O'Conner will attest:

WORK IN MAURY COUNTY.

Dr. Geo. R. White, State Veterinarian, Nashville, Tenn.:

DEAR DOCTOR: I am herewith enclosing a summary of hog cholera eradication work performed by this force since commencement of the work, July 21, 1914. This covers in detail every herd of hogs handled and is believed to be what you desire.

I trust this will be satisfactory. Yours truly,

JNO. P. O'CONNER,
Inspector in Charge.

HOG CHOLERA COUNTY CONTROL INVESTIGATIONS— COMPLETE REPORT, MAURY COUNTY, TENNESSEE.

JULY 21, 1914, TO DECEMBER 31, 1914.

I. General Statement—

1.	Number of hogs raised in Maury County in 1912.....	73,234
2.	Number of hogs raised in Maury County, 1913.....	69,787
3.	Number of hogs that died of hog cholera in Maury County in 1912	8,399
4.	Number of hogs that died of hog cholera in Maury County in 1913	6,360
5.	Date when headquarters established in Maury County, June 5, 1914.	
6.	Date on which first herd was treated, July 21, 1914.	
7.	Number of outbreaks in Maury County from January 1, 1914, to time of treatment of first herd	384
8.	Number of hogs that died from hog cholera from Janu- ary 1, 1914, to time of treatment of first herd	2,430
9.	Total number of outbreaks of hog cholera in Maury County since treatment of first herd.....	133
10.	Total number of hogs that died of hog cholera in Maury County since treatment of first herd—	
	Died before treatment	336
	Killed for autopsy	73
	Died after treatment	255
11.	Number of hogs raised in Maury County in 1914 (esti- mated)	70,250
12.	Number of farms in Maury County on which active in- fection existed at time of treatment of first herd.....	26
2.	Results in infected herds treated exclusively with serum alone—	
1.	Number of herds treated	47
2.	Number of hogs treated	1,295
3.	Number of hogs showing high temperature (above 104 deg.) or other symptoms when treated.....	407
4.	Number of hogs showing high temperature (above 104 deg.) or other symptoms when treated that have died..	73
5.	Total number of treated hogs that died.....	73
3.	Results in exposed herds treated exclusively with serum alone—	
1.	Number of herds treated	21

2.	Number of hogs treated	363
3.	Number of hogs showing high temperature (above 104 deg.) or other symptoms when treated	83
4.	Number of hogs showing high temperature (above 104 deg.) or other symptoms when treated that have died.	1
5.	Total number of treated hogs that have died.....	1
4.	Results in infected herds where both the simultaneous inoculation and the serum alone were used—	
1.	Number of herds treated	86
2.	Number of hogs given simultaneous inoculation.....	1,423
3.	Number of hogs given simultaneous inoculation that died	18
4.	Number of hogs given serum alone	1,304
5.	Number of hogs given serum alone that died.....	275
6.	Total number of treated hogs that died.....	293
5.	Results in exposed herds where both the simultaneous inoculation and the serum alone were used—	
1.	Number of herds treated	4
2.	Number of hogs given simultaneous inoculation.....	29
3.	Number of hogs given simultaneous inoculation that died	none
4.	Number of hogs given serum alone.....	51
5.	Number of hogs given serum alone that died	none
6.	Total number of treated hogs that died.....	none
6.	Results in exposed herds following the use of serum alone on pregnant sows—	
1.	Total number of sows treated	19
2.	Total number of treated sows that aborted.....	3
7.	Results in exposed herds following the use of serum alone on pregnant sows—	
1.	Total number of sows treated	5
2.	Total number of treated sows that aborted	none
8.	Results in infected herds following the simultaneous inoculation of pregnant sows—	
1.	Total number of sows treated	10
2.	Total number of treated sows that aborted.....	none
9.	Results in exposed herds following the simultaneous inoculation of pregnant sows—	
1.	Total number of sows treated	none
2.	Total number of treated sows that aborted.....	none

10. Miscellaneous data—

1. Number of authenticated cases of sterility produced by the simultaneous method when used on well sows....	none
2. Number of infected herds treated with serum alone in which hog cholera later reappeared	1
(If cholera reappeared a number of times in the same herd, each reappearance should be classed as a herd.)	
3. Number of exposed herds treated with serum alone in which hog cholera appeared later in the season.....	1
4. Number of infected herds treated with the simultaneous method in connection with the serum alone, in which hog cholera later reappeared	none
5. Number of exposed herds treated with the simultaneous method in connection with the serum alone, in which natural infection appeared later in the season.....	none
6. Number of well herds treated by simultaneous method in which hog cholera appeared as the result of treatment	none
7. Percentage of abscesses resulting from treatment.....	.0165
8. Total number of hogs left untreated on account of advanced disease	91
9. Number of hogs left untreated on account of advanced disease that have died	82

11. Sources of infection or ways in which hog cholera is spread—

	Cases.	Per Cent.
1. Exchanging labor and visiting neighbors....	23	14.56
2. Exposure to sick hogs in adjoining pens or pastures	20	12.66
3. Infection harbored on premises.....	16	10.12
4. Carried by dogs	10	6.38
5. Infected cars and public highways	8	5.06
6. Purchase of new stock	8	5.06
7. Contaminated streams	6	3.78
8. Birds	31	19.62

Name other known sources of infection.

Feeding on dumps	5	3.16
Indefinite	29	18.35
Vaccination (virulent virus serum faulty potency). ..	2	1.26

STATE ANTI-HOG CHOLERA SERUM PLANT.

Dr. Geo. R. White, State Veterinarian:

SIR: In compliance with your request I take pleasure in submitting the following report upon the operation of the State Serum Plant from November 1, 1913, to December 20, 1914:

Number of virus permits issued	8,532
Amount of serum manufactured	3,505,875 cc.
Amount of serum used in plant (including breakage or waste)	267,172 cc.
Amount of serum shipped	3,069,908 cc.
Number of orders shipped	3,025
Amount of serum on hand	168,795 cc.
Number of immune hogs used in plant.....	985
Number of virus shoats used in plant	1,050
Number of immune hogs on hand	92
Number of virus shoats on hand	41
Number of test pigs on hand	8
Number of hyper immune hogs on hand.....	20

TOTAL EXPENDITURES.

Legislative appropriation (paid on plant).....	\$10,000.00
Amount paid for hogs used in plant.....	19,479.65
Operating expenses, viz: Salaries of employes, traveling expenses of employes, repairs, supplies, stationery, stamps, expressage, telephone, telegraph, printing, drayage, lights, water, gas, feed, coal, vaccinating outfits, shipping boxes, bottles, ice, gasoline, oil, electric power, serum purchased from other plants, work in Maury County, etc...	33,695.55
Amount refunded on orders countermanded	231.30
Total	\$63,406.50
Permanent improvements and equipment added to plant since purchase	14,278.33
Total expenditures	\$77,684.83

RECEIPTS.

Legislative appropriation	\$10,000.00
Amount received for serum.....	\$46,048.62
Amount received for vaccinating outfits.....	3,119.92
Amount received for other supplies	95.00

Amount received for hyper immune carcasses	12,181.29
Amount received for virus carcasses	840.00
Amount received for serum sold from other plants.....	5,400.00

Total receipts\$77,684.83

STOCK ON HAND.

Value immune hogs	\$ 2,208.00
Value virus pigs	330.00
Value test pigs	32.00
Value hyper immunes	1,200.00
Vaccinating outfits	630.25
Value serum	2,531.92

Total\$ 6,932.17

Amount unpaid bills on file 8,500.00

It will be observed by reference to the above that the real indebtedness of the plant at this time is only \$1,567.83, after permanent improvements to the amount of \$14,278.33 have been added to the plant, which originally cost \$14,300.00, against a legislative appropriation of only \$10,000.00. In other words, Tennessee now only lacks \$1,567.83 of owning a serum plant worth \$28,578.00 which only cost \$10,000.00. A sufficient amount of serum has been sold in other States to pay for all improvements which have been added.

Respectfully submitted,

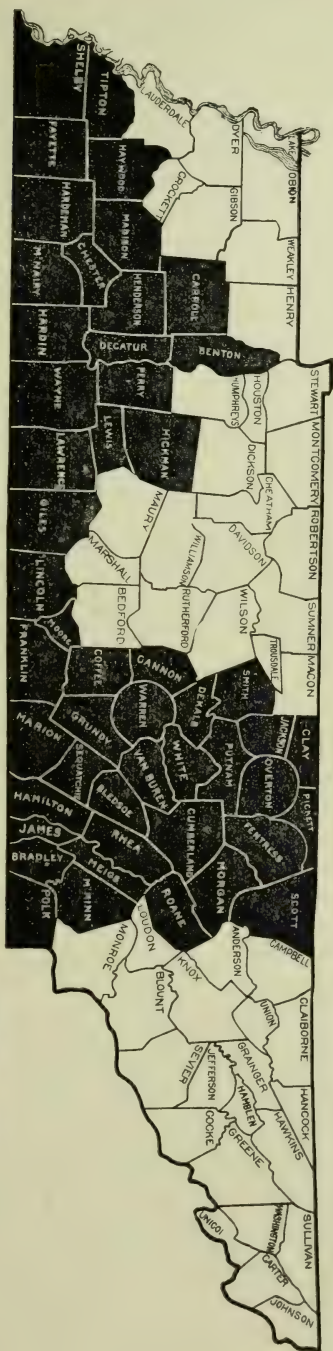
C. S. BOYD,
General Manager.

SHEEP SCAB.

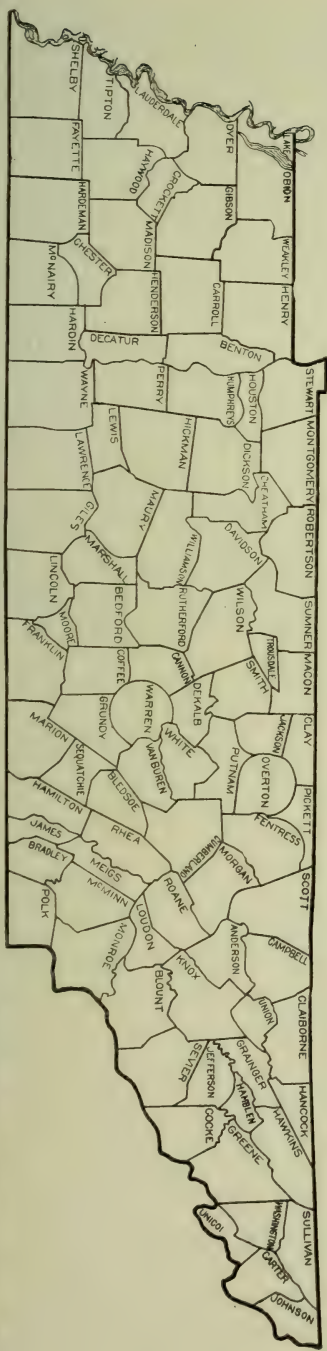
Sheep scab was entirely eradicated after it had gained a firm foothold in 17 counties in Middle Tennessee. So far as we know no sheep scab exists in the State at this time.

TEXAS FEVER.

The Texas fever tick has been completely eradicated and the whole State released from State and Federal quarantine. The completion of tick eradication work after ticks had infested no less than 51 counties is one of the greatest triumphs of live stock sanitary control work in Tennessee or any other State. This placed Tennessee in the forefront as a cattle-raising State. The following two maps graphically illustrate what has been accomplished:



Map showing the extent of tick infestation at the beginning of tick eradication work.



Map showing conditions in Tennessee after the work of tick eradication had been completed and the State released from Federal and State quarantine.

OTHER DISEASES.

Isolated outbreaks of the following diseases have been encountered since the last report: Glanders, black leg, pink eye in cattle, malignant catarrh, influenza, aphthous stomatitis, lip and leg ulceration, Johne's disease, lung worm, stomach worm, nodular disease, bovine tuberculosis and forage poison.

INTERSTATE MOVEMENT OF LIVE STOCK.

Number horses shipped from Tennessee into States requiring health certificates, 8,021.

Number mules shipped from Tennessee into States requiring health certificates, 22,180.

Number of cattle shipped from Tennessee into States requiring health certificates, 6,599.

Number of horses shipped from other States into Tennessee accompanied by health certificates, 8,849.

Number of mules shipped from other States into Tennessee accompanied by health certificates, 9,361.

NOTE—Tennessee does not require health certificates on horses and mules from any State except Illinois. Most of the above mentioned animals came from that State.

Number of dairy and breeding cattle shipped from other States into Tennessee accompanied by health certificates, including tuberculin test, 5,949.

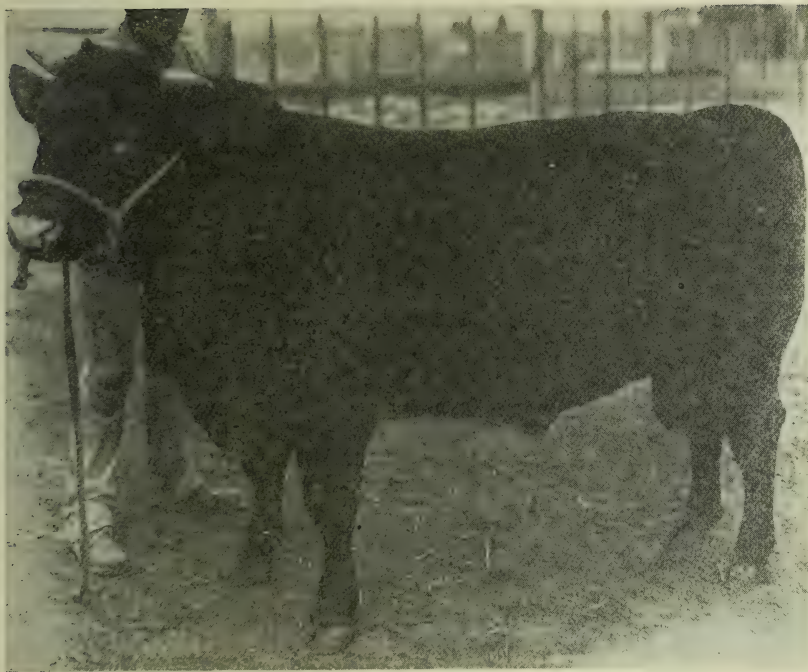
APPRAISEMENT AND SLAUGHTER.

The following animals have been appraised and slaughtered at county expense: Glanders, 5; bovine tuberculosis, 52.

PUBLICITY OF THE DEPARTMENT.

Since my incumbency in office a diligent effort has been made to place the work of the Live Stock Department before the citizens of Tennessee in its proper light. Interviews and specially prepared articles for publication have appeared at frequent intervals in most of the county and State papers on the following subjects: Hog cholera, anthrax, Texas fever, Johne's disease, black leg, glanders, sheep scab, lump jaw, aphthous stomatitis, stomach worm, pink eye, lung worm, forage poison, sneeze weed poison, phytolacca poison, hydrophobia, etc. More than 20,000 copies of one bulletin entitled, "Hog Cholera and Serum Treatment," have been printed and distributed. Several thousand bulletins, circulars and booklets pertaining to the many contagious and infectious diseases of animals have been published and distributed through the mail and otherwise.

The writer has accompanied two agricultural special trains which toured the State under the direction of the Commissioner of Agri-



Shorthorn Bull Imperial Braco, Lespedeza Farm.

culture in cooperation with the railroads. Live stock exhibits were part of the equipment of each of these trains. Typical animals and poultry of the several breeds were carried. In my opinion the beneficial effects of these live stock demonstrations will be far-reaching.

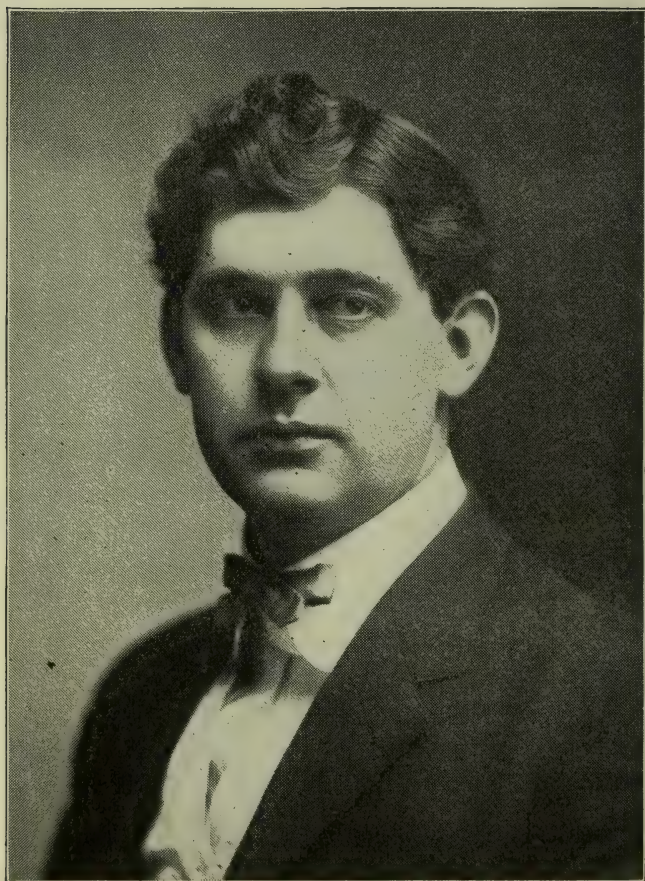
CONCLUSION.

In conclusion I desire to thank you as Commissioner of Agriculture for your interest on all occasions in the work and welfare of the Live Stock Department and for the painstaking consideration you have given each and every recommendation which I have submitted to you pertaining to live stock sanitary control work, and the courteous treatment accorded me on all occasions. My thanks are due and are hereby extended to all the members of the Agricultural Department, the Governor and to all other State officials, also the various county officials and railroads for their many courtesies and unstinted co-operation.

Respectfully submitted,

GEORGE R. WHITE, M.D., D.V.S.,
State Veterinarian.

State Capitol, Nashville, Tennessee, December 20, 1914.



A. L. GARRISON, Chief Feed, Seed and Fertilizer Inspector.

FEED, SEED AND FERTILIZER INSPECTION.

REPORT OF A. L. GARRISON, CHIEF INSPECTOR.

Hon. T. F. Peck, Commissioner of Agriculture, Nashville, Tennessee:

SIR: I have the pleasure to submit herewith report of my work in Feed, Seed and Fertilizer Inspection for the period beginning January 1, 1913, to January 1, 1915. As you are aware, in October, 1913, the work of fertilizer inspection was placed in this department.

Our activities in all three branches of this work will be found in Volume 2, Nos. 1 and 2, and Volume 3, Nos. 1, 3 and 5, of "Tennessee Agriculture," and will therefore not need further mention in this condensed report. I will, however, mention a few facts and submit brief statistics on fertilizer for the year 1914. The annual bulletin on fertilizer is now being made up and is almost ready for the printer, and will be ready for distribution by February, 1915, which makes it too late to be bound in this report.

We have collected from the dealers in the various counties of the State, for the year 1914, 456 official samples, covering a like number of brands offered for sale. The State Chemist informs me that of this number about 60 will fall below the guarantee. The matter of shortages will be threshed out by this Department and the fertilizer manufacturers during the early part of 1915. I have spent some time in compiling what I consider very interesting figures on the sale and distribution of fertilizer for this year.

There has been sold by the manufactures combined for the year 100,000 tons. We have taken fifty thousand tons from the spring and fall shipments and located it in the counties where it was consumed or reshipped to other counties. It is not meant to be understood that the following list means that all the fertilizer shown to have been shipped to a county was consumed in that particular county. For instance, part of the amounts billed to Lawrence may have been used in Wayne, Perry and other counties. Knox County did quite a reshipping business. Warren, White, Greene, and other counties did the same. Neither is it meant that the amount shown is all that the county used, as it will be easily understood that quite a number of counties are off the railroads and, so far as our records show, no shipments were made. The same is true of those counties where delivery is made by boat, as we are unable to locate all the landings from the reports made of these shipments by the manufacturers. However, we can say with accuracy that the fifty thousand tons went to the following counties:

DISTRIBUTION OF FERTILIZER.

	Complete Fertilizer (Tons)	Acid Phosphate (Tons)	Total (Tons)
Anderson	341	139	480
Bedford	158	88	246
Benton	407	101	508
Bledsoe	74	35	109
Blount	403	506	909
Bradley	549	179	728
Campbell	327	235	562
Cannon .....	...	...	...
Carroll	838	25	863
Carter	173	126	299
Cheatham	314	38	352
Chester	95	21	116
Claiborne	478	401	879
Clay	6	5	11
Cocke	379	403	782
Coffee	366	117	483
Crockett	58	16	74
Cumberland	279	130	409
Davidson	45	30	75
Decatur	353	6	359
DeKalb .....	...	...	...
Dickson	439	18	457
Dyer .....	...	...	...
Fayette	54	32	86
Fentress	15	...	15
Franklin	741	539	1,280
Gibson	550	6	556
Giles	485	60	549
Grainger	199	152	351
Greene	2,378	1,193	3,571
Grundy	27	6	33
Hamblen	700	507	1,207
Hamilton	187	71	258
Hancock .....	..	...	...
Hardeman	574	24	598
Hardin	500	47	547
Hawkins	492	150	642
Haywood	6	...	6

DISTRIBUTION OF FERTILIZER.—*Continued.*

	Complete Fertilizer (Tons)	Acid Phosphate (Tons)	Total (Tons)
Henderson	760	96	856
Henry	398	121	419
Hickman	135	16	151
Houston	49	3	52
Humphreys	14	24	38
Jackson	46	42	88
James	169	11	180
Jefferson	636	943	1,579
Johnson	135	93	228
Knox	887	1,317	2,204
Lake .....	...	...	...
Lauderdale	7	...	7
Lawrence	1,120	483	1,603
Lewis	136	5	141
Lincoln	338	158	496
Loudon	622	220	842
McMinn	1,090	288	1,178
McNairy	841	71	912
Macon	5	10	15
Madison	147	32	179
Marion	29	10	39
Marshall	31	...	31
Maury	30	...	30
Meigs	34	19	53
Monroe	767	420	1,187
Montgomery	538	129	667
Moore .....	...	...	...
Morgan	561	132	693
Obion	2	19	21
Overton	967	233	1,200
Perry .....	...	...	...
Pickett .....	...	...	...
Polk	312	12	324
Putnam	808	714	1,522
Rhea	538	176	714
Roane	276	10	286
Robertson	3,318	432	3,750
Rutherford	746	157	903

DISTRIBUTION OF FERTILIZER.—*Continued.*

	Complete Fertilizer (Tons)	Acid Phosphate (Tons)	Total (Tons)
Scott	91	30	121
Sequatchie	11	...	11
Sevier	66	197	263
Shelby	68	82	150
Smith .....	...	...	...
Stewart	66	3	69
Sullivan	631	132	763
Sumner	465	216	681
Tipton	24	40	64
Trousdale	354	30	384
Unicoi .....	...	...	...
Union	64	...	64
Van Buren .....	...	...	...
Warren	1,092	1,618	2,710
Washington	952	439	1,391
Wayne .....	...	...	...
Weakley	278	7	285
White	240	412	652
Williamson	4	...	4
Wilson	43	20	63
Total	35,048	15,164	50,212

It will be noted in the above list that more than 15,000 tons of high grade acid phosphate was used by the various counties. This, we think, speaks well for the progress of these counties. There has been a steady increase in the use of all grades of commercial fertilizer, as shown by the following comparisons:

In 1912 the total sales amounted to about 70,000 tons; 1913, 85,000 tons; 1914, 100,000 tons.

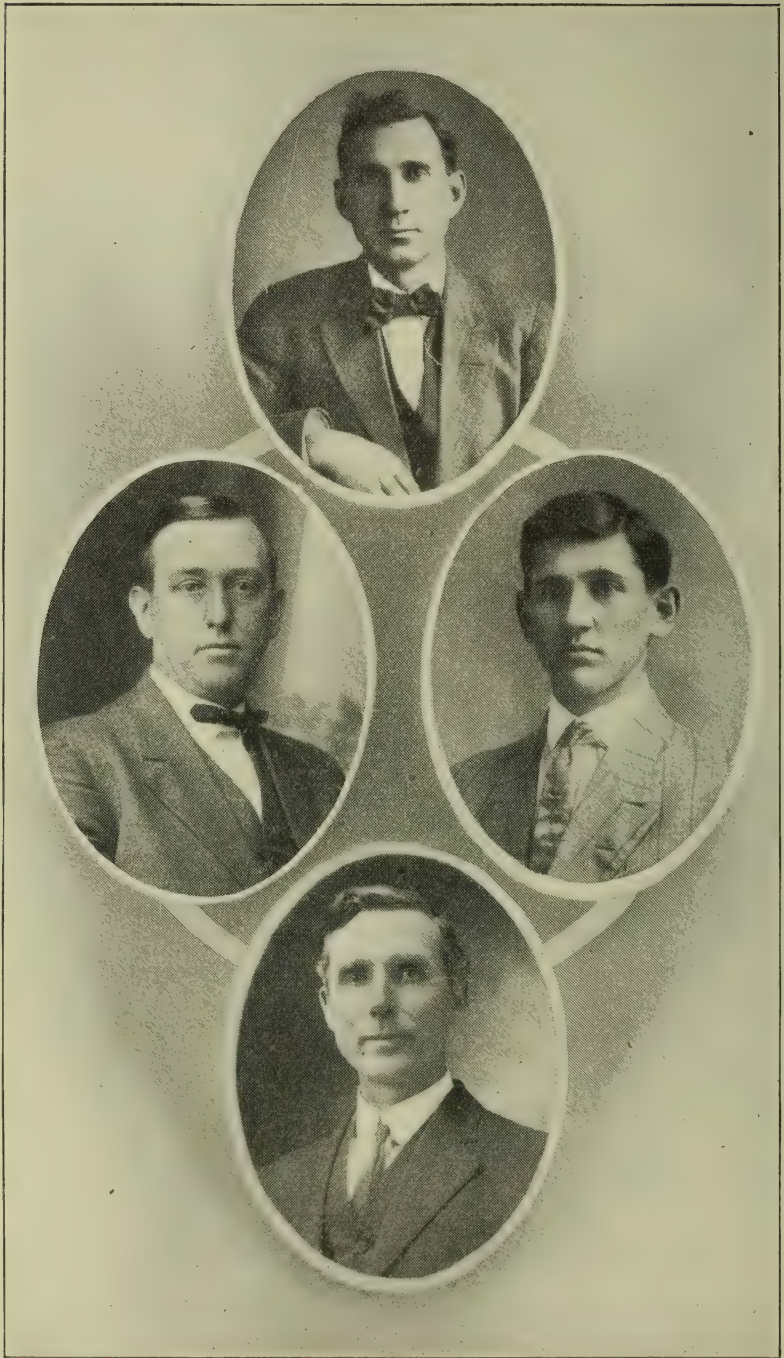
FEED, SEED AND FERTILIZER RECEIPTS.

Receipts from the sale of feed, seed and fertilizer inspection tags and stamps for the period beginning January 1, 1913, to January 1, 1915, showing collections for each month, with expense of collection, giving net profit to the State.

		Total	Expense	Net Revenue
January—	Feed.....\$	2,041.06		
	Seed.....	1,052.00		
	Fertilizer..	1,956.25	\$ 5,049.31	\$ 525.56
				\$ 4,523.75

FEED, SEED AND FERTILIZER RECEIPTS.—*Continued.*

			Total	Expense	Net Revenue
February—	Feed.....	1,968.73			
	Seed.....	1,266.46			
	Fertilizer..	3,967.75	7,197.94	1,047.92	6,150.02
March—	Feed.....	1,946.27			
	Seed.....	453.85			
	Fertilizer..	6,960.00	9,360.12	297.39	9,062.73
April—	Feed.....	1,460.27			
	Seed.....	106.46			
	Fertilizer..	1,124.50	12,809.23	924.16	11,885.07
May—	Feed.....	1,078.50			
	Seed.....	14.40			
	Fertilizer..	2,130.00	3,222.90	447.80	2,775.10
June—	Feed.....	1,301.77			
	Seed.....	154.00			
	Fertilizer..	225.00	1,680.77	727.91	925.86
July—	Feed.....	1,678.50			
	Seed.....	48.85			
	Fertilizer..	717.50	2,444.85	1,000.74	1,444.11
August—	Feed.....	1,576.25			
	Seed.....	180.06			
	Fertilizer..	2,700.00	4,456.31	760.78	3,695.53
September—	Feed.....	2,215.50			
	Seed.....	523.58			
	Fertilizer..	6,522.50	9,261.58	148.41	9,113.17
October—	Feed.....	2,530.00			
	Seed.....	315.25			
	Fertilizer..	5,411.25	8,256.50	981.43	7,275.07
November—	Feed.....	2,032.25			
	Seed.....	17.50			
	Fertilizer..	197.50	2,247.25	465.26	1,781.99
December—	Feed.....	2,100.35			
	Seed.....	67.50			
	Fertilizer..	.....	2,167.85	1,015.62	1,152.23
1914					
January—	Feed.....	2,074.10			
	Seed.....	803.38			
	Fertilizer..	1,545.00	4,422.48	507.45	3,915.03
February	Feed.....	1,991.25			
	Seed.....	450.99			
	Fertilizer..	4,020.00	6,462.24	726.75	5,735.49
March—	Feed.....	2,381.00			
	Seed.....	285.91			
	Fertilizer..	8,055.00	10,721.91	262.90	10,459.01
April—	Feed.....	1,653.05			
	Seed.....	35.90			
	Fertilizer..	13,788.50	15,477.45	957.21	14,520.24



NOBLE C. WHITE,

Feed, Seed and Fertilizer Inspector for Middle Tennessee.

J. W. WYNN,

Feed, Seed and Fertilizer Inspector for East Tennessee.

H. N. HARDEMAN,

Stenographer.

A. M. STOUT,

Feed, Seed and Fertilizer Inspector for West Tennessee.

FEED, SEED AND FERTILIZER RECEIPTS.—*Continued.*

			Total	Expense	Net Revenue
May—	Feed.....	1,487.15			
	Seed.....	24.50			
	Fertilizer..	3,592.50	5,104.15	1,133.11	3,971.04
June—	Feed.....	1,241.00			
	Seed.....	20.00			
	Fertilizer..	510.00	1,771.00	675.00	1,096.00
July—	Feed.....	1,901.00			
	Seed.....	60.00			
	Fertilizer..	437.90	2,398.90	682.33	1,716.57
August—	Feed.....	1,445.00			
	Seed.....	220.20			
	Fertilizer..	4,772.15	6,437.35	586.83	5,850.52
September—	Feed.....	1,839.75			
	Seed.....	222.25			
	Fertilizer..	8,251.75	10,313.75	687.11	9,626.64
October—	Feed.....	2,027.00			
	Seed.....	192.75			
	Fertilizer..	4,470.25	6,690.00	1,105.57	5,584.43
November—	Feed.....	1,973.00			
	Seed.....	55.00			
	Fertilizer..	1,363.75	3,391.75	292.30	3,099.45
December—	Feed.....	2,586.75			
	Seed.....	.....		
	Fertilizer..	.....	2,586.75	711.87	1,874.88
Total			\$143,932.36	\$ 16,671.41	\$127,074.20

In addition to the above expenses there was a legislative appropriation of \$2,000.00 for fertilizer inspection, tags, etc., which makes the total expense incurred \$18,671.41, which includes every item such as salary, traveling expenses, printing, etc. The net revenue to the State from these three laws was \$125,260.95 for the two years. One of the greatest aids to the efficient enforcement of the agricultural laws is the chemical laboratory which was authorized by the last Legislature, with an appropriation of \$7,000.00. This laboratory, with Mr. J. W. Sample in charge, together with the field inspectors, Messrs. J. W. Wynn, Noble C. White and A. M. Stout, have made it possible for the consumer to feel assured of a square deal in the use of mixed feedstuffs and commercial fertilizers.

I herewith submit brief report from the State Chemist, which is self-explanatory:



J. W. SAMPLE, State Chemist.

REPORT OF STATE CHEMIST.

"DEAR SIR: Below you will please find an approximation of the amount of service rendered by the State Chemical Laboratory since it was created in March, 1913:

1913

Official fertilizer samples examined.....	369 @ \$ 5.00	\$1,845.00
Farmers' fertilizer samples examined	4 @ 5.00	20.00
Official feed samples examined	312 @ 3.00	936.00
Farmers' feed samples examined	20 @ 3.00	60.00
Official seed samples examined	136 @ 1.50	204.00
Farmers' seed samples examined	28 @ 1.50	42.00
Soil samples for farmers	6 @ 15.00	90.00
Limestone samples for farmers	2 @ 10.00	20.00
Water samples for farmers	2 @ 15.00	30.00
Phosphate rocks for farmers	4 @ 3.00	12.00
Miscellaneous analyses and opinions		120.00—\$3,379.00

1914

Official fertilizer samples examined.....	427 @ \$ 5.00	\$2,135.00
Farmers' fertilizer samples examined	29 @ 5.00	145.00
Farmers' feed samples examined	14 @ 3.00	42.00
Farmers' seed samples examined	21 @ 1.50	31.50
Soils for farmers	5 @ 15.00	75.00
Limestone for farmers	24 @ 10.00	240.00
Water samples for farmers	2 @ 15.00	30.00
Miscellaneous analyses and opinions		200.00
Phosphate rocks for farmers	5 @ 3.00	15.00—\$2,913.50

Total to date		\$6,292.50
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Prospective Samples

Official feed samples	325 @ \$ 3.00	\$ 975.00
Official seed samples	150 @ 1.50	225.00—\$1,200.00
		<hr/> \$7,492.50

"The feed and seed samples for 1914 and 1915 have not come in as yet, and the above figures are merely approximations, but it is more than probable that the actual number will be in excess of these figures.

"The State now owns a well-equipped chemical laboratory plant, valued at \$1,000.00, which was paid for out of the appropriation of \$7,000.00 allowed by the last Legislature.

"Respectfully submitted,

"J. W. SAMPLE,
"State Chemist."

As before mentioned, a great deal of work has been accomplished which will be set out in detail on other pages of this biennial report and a review would be merely repetition.

Before concluding, I most sincerely wish to reiterate the exact sentiment expressed in the closing sentence of my last biennial report, which is to most heartily thank you for the many courtesies you have invariably shown this department.

Yours very truly,

A. L. GARRISON,

Chief Feed, Seed and Fertilizer Inspector.

BIENNIAL REPORT OF STATE ENTOMOLOGIST.

To the Hon. T. F. Peck, Commissioner of Agriculture.

SIR: As State Entomologist and Plant Pathologist, I have the honor to submit herewith, in brief, my biennial report.

Together with the development of the agricultural and horticultural interests of the State, the demands on the Board of Entomology have increased many fold. The practical value of the assistance rendered has been felt on the farm, in the orchard, in the field, in the forest, in the garden, and in the home. The farming and fruit-growing interests have been materially aided in solving problems of insect control.

Investigations have been made on unknown life histories of insects to the end of finding means for controlling or eradicating injurious forms found within the State. The permanent improvement and extension of the fruit, vegetable and other crops of Tennessee is in a very great measure dependent upon the knowledge the grower has of methods for preventing and combating insects and fungus diseases. Many of the failures in fruit production are traceable to ignorance or the presence and attacks of insects and fungi, and of means of prevention or remedy.

Fruit interests of Tennessee are, year by year, attracting additional attention. Few States rival this State in favorable conditions for fruit tree propagation and orchard development. For years the nursery and orchard interests of Tennessee have formed a considerable part of its agricultural wealth. Insects and plant diseases, if not studied and controlled, bring disaster, discouragement and abandonment of enterprises of great value to the State and to the health and happiness of its people. A few of the more practical lines of work accomplished during the past two years will be found under the following heads:

PROBLEMS OF INSECT CONTROL.

The introduction to the State of dangerous insect pests and plant diseases has been given careful consideration. All foreign shipments of plants and plant products likely to be infested have been carefully inspected, and the spread of injurious pests within the State has been given due attention. Only within a period of a very few years has the practical bearing of insects to the farmer been fully appreciated. If every farmer could only realize that annually he is paying a tax to insects of from \$200.00 to \$1,000.00, or in other words, one-tenth of all his crops goes to feed destructive pests, more attention would be directed to this preventable loss. More emphasis should be laid on the



Lincoln County Teachers and Corn Club Boys.

fact that good farming and insect control go hand in hand—the one depending upon the other. The annual loss in Tennessee from insects destroying crops is as follows:

Corn	\$5,558,300
Wheat	794,900
Barley	7,600
Rye	22,400
Buckwheat	3,800
Oats	307,100
Hay and forage crops.....	1,261,800
Tobacco	530,145
Nursery stock, flowers and plants.....	104,200
Strawberries	83,579
Orchards	345,900
Grapes	1,404
Forest and timber products.....	851,100
<hr/>	
Total	\$9,872,228

INVESTIGATIONS.

The knowledge of the life histories of certain insects in the State not being known, it became imperative that such information be at hand to best know how to prevent or control these forms. Investigations during the period have been carried on with the following insects, which work at present is in progress: Clover leaf weevil, peach tree borer, strawberry root louse, corn root worm, army worm, cotton leaf worm and the pickle worm. The dissemination of the dangerous peach diseases known as peach yellows and peach rosette has been studied and valuable notes added to those already obtained. All of this research work is of inestimable value in prescribing methods for practical control.

NURSERY INSPECTION.

The chief duty of the board when organized was the annual inspections of the nurseries of the State and work incident thereto. Since 1905 the nurseries have increased greatly in acreage and in numbers, from 109 to 407. The increased appropriation of 1911 made it possible to increase the inspection force, thus giving more efficiency and making it possible to concentrate most of the regular inspection work to the summer and fall months, supplemented by the inspection of the foreign importations of nursery stock during the winter and spring months. The foreign inspections necessitate prompt attention

in that no shipments are permitted to be unpacked until the inspector is present. Office work pertaining both to the State and foreign inspections continues throughout the year. Too great importance cannot be directed to the inspection feature of the board's work, for by it the State derives a protection from the dissemination and the introduction of dangerous insect pests, which easily could bring calamity to many of the agricultural and horticultural interests of the State.

ORCHARD INSPECTION.

The time has come in the development of the work for active orchard inspection. There is much loss at present from diseases and scale insects in the plantings of orchards contiguous to abandoned and neg-



The Agricultural Special in West Tennessee.

lected trees which should be pruned and thoroughly sprayed, or better still, removed and burned. The best interests of the fruit business of the State cannot be realized until the old and neglected orchard, considered as dangerous, is dealt with as a public nuisance. The present law gives the State Board of Entomology the power to deal with such cases, but the appropriations are barely sufficient to adequately cope with nursery inspection and service.

PRUNING AND SPRAYING DEMONSTRATIONS.

That owners of orchards may know the proper methods of pruning the various fruit trees and vines and also of spraying them with the

most effective chemicals and sprayers, many practical orchard demonstrations have been given before gatherings in various parts of the State. Time so directed has done much toward encouraging the renewing of the old family orchard and the planting of new ones.

AGRICULTURAL TRAIN.

For two months and a half during the past summer the Entomologist gave the major part of his time in getting together an exhibit of the economic insects and plant diseases of the State; also a collection of the various types of sprayers and the equipment necessary for spraying; a collection of insecticides and fungicides of most general value; fruits and vegetables typical of the State; and equipment showing modern methods of beekeeping, for the purpose of equipping a car for the agricultural train to be run over the various railroads of Tennessee during July, August and a part of September. The Entomologist and Apiary Inspector were in charge of this exhibition car and went with it throughout the trip, giving explanations and answering questions to interested visitors. Literature was distributed and names taken of those wishing to receive regularly the bulletins and reports of the board.

EXHIBITS OF ECONOMIC INSECTS.

Many of the losses ascribed to the agricultural and horticultural interests of the State could be prevented if persons recognized the injurious forms and would report their presence before they had become established and permanent injury had resulted. The economic insects have been exhibited and explained at the State fairs and many of the county fairs, farmers' institutes and conventions of fruit growers. This exhibit has meant much in educating the people in regard to the State's insect friends and enemies.

CLASSES IN INSECT STUDY.

The Entomologist has conducted classes regularly at the University of Tennessee during the two years, part of the year being devoted to general entomology and the remainder to economic study of insects in relation to the farm, garden and orchard interests of the State. The value of the board is greatly enhanced by being able to give instructions to young people who will in turn instruct others and put into practice in Tennessee what they have learned.

FARMERS' INSTITUTES.

The services of the Entomologist have been secured many times to make talks before gatherings of farmers at institutes, fairs and conventions.

COOPERATIVE EXPERIMENTS.

That the efficiency of certain proprietary remedies may be tested in different sections of the State, cooperative experiments have been conducted under the supervision of the Entomologist. Valuable determinations have thus been made and the applicability of these preparations for the State are thus decided in a practical way. Those performing the experiments, as well as the communities in which the work has been conducted, have been greatly benefited, and the information gained furnishes the board with dependable facts.

EXHIBITION OF SPRAYERS AND ACCESSORIES.

The collection of spray machinery of all kinds has continued throughout the year, donations having been made by the factories. For the Entomologist to familiarize himself with the apparatus manufactured for spraying and to be able to answer questions of those seeking information as to the efficiency, simplicity and durability of the respective types is of direct practical value.

TESTING OF PROPRIETARY INSECTICIDES AND FUNGICIDES.

The manufacturers of insecticides and fungicides of all kinds have been asked, and in nearly every case have gladly donated their products for experimental purposes. These preparations have been tested to determine constituents, also their efficiency for controlling specified pests at recommended dilutions. Data gained from this investigation has been of considerable value.

ACCESSION FILE.

As complaints come in from the various parts of the State concerning destructive insects, a prompt reply is made, if through correspondence the problem can be satisfactorily dealt with. If not, an investigation is made on the premises. Following the observations, specimens, if necessary, are taken for further study in the laboratory. A card index file, known as the "Accession File," contains all these reported troubles, giving name of the pest, where found, with the date of its findings, its host, the stage of development, together with full notes as to its first appearance, extent of injury, etc. This file facilitates the keeping of records, and affords a readily available reference of inestimable value.

PUBLICATIONS.

The quarterly publication of bulletins of both timely and important subjects has continued and been in much demand. These issues deal

with destructive insects, their life histories and methods for their control, also spray mechanics and chemicals for the practical control of pests of the farm, orchard, garden and home.

CORRESPONDENCE.

The practical value of the board is proven daily by the correspondence coming to the office, asking advice on insect life histories and methods for controlling destructive pests and encouraging those insects which are beneficial. Correspondence which used to be sent to Washington, D. C., and referred to this office, now comes direct; thus often making beneficial methods immediately applicable, and in many cases



Waiting for the Agricultural Special.

preventing unnecessary losses. The duties of the board are now generally known to all Tennesseans, and many are taking advantage of the assistance available.

COUNTY CORRESPONDENTS.

To facilitate the work of the board and that every county in the State shall receive equal attention by way of controlling destructive insect pests and plant diseases, we have secured the assistance of 173 persons, ranging from two to eight for each county in the State, in gratuitously reporting to the board any outbreaks of objectionable pests in their counties and regularly filling out blanks, sent from this office, asking timely and important questions pertaining to the agricultural and horticultural interests affected by insects and fungi. By this means

no additional expense is incurred and much benefit directed to those sections most in need. It is often necessary to go to the place where trouble is reported; in other instances practical assistance can be given through correspondence. The size of the State and the limited appropriation for the workings of this board make it impracticable for the Entomologist and his assistants to be continually out of the office. The work of the county correspondents has been one of the best means of extending the influence of the board in sections of the State unacquainted with the source of assistance in dealing with practical methods of insect control.

In a very practical and efficient way has the work of the State Board of Entomology been felt in the building up and extending the great interests for which the State, with due protection from insect pests and dangerous plant diseases, is so admirably adapted; those interests which are the basis of all human efforts—horticulture and agriculture.

For a full report of the State Board of Entomology see the Ninth and Tenth Annual Reports of the State Entomologist and Plant Pathologist for 1913-1914.

Respectfully submitted,

G. M. BENTLEY,
State Entomologist.



DR. J. S. WARD, State Inspector of Apiaries.

BIENNIAL REPORT OF STATE INSPECTOR OF APIARIES.

To the Commissioner of Agriculture, Hon. T. F. Peck.

SIR: Section 10 of the Tennessee Apiary Laws requires "that the Inspector of Apiaries shall make an annual report to the Commissioner of Agriculture," and in compliance with the law I herewith submit my annual report for the year ending December 19, 1914.

HONEY HARVEST IN 1913.

Beginning on page 274 of the July, 1914, issue of "Tennessee Agriculture," will be found my report for 1913. In that report will be found the following statements:

"The year 1913 was a very favorable one for the bee-keepers of Tennessee, notwithstanding the severe drouth during the summer. The honey flow from white clover was an unusually heavy one over nearly the whole State, followed in many localities by a good fall flow from the aster bloom. The amount of honey and wax gathered can safely be estimated at \$300,000.00."

CAUSE OF 1914 FAILURE.

The severe drouth of 1914 proved more far-reaching than was anticipated. It prevented the germination of the white clover seed and thus stopped the growth of the Tennessee bee-keepers' most valuable honey plant. Early in the spring did the bee-keepers realize that there was no white clover growing and instead of a big honey harvest a number began preparation to feed their bees to prevent starvation. However, other less valuable plants yielded sufficient nectar to tide over until the aster bloom came. In some localities there was quite an abundance of honey dew which the bees have been allowed to keep for their winter stores. It is to be hoped that the honey dew will have enough aster honey mixed with it to prevent dysentery during the winter. But little honey, comparatively, has been for sale. It certainly has been an off year for the Tennessee bee-keepers. However, this should not discourage. Every business has its up and downs, good years and bad years. History gives the bee-keeper four good years to every bad one.

PROSPECTS FOR 1915.

The coming year bids fair to be a good one, for everywhere now we find young white clover rooting and growing. The wise bee-keeper will get ready for a big harvest during the coming season.

Since there was to be no honey harvest, I encouraged the bee-keepers to make progress by "making increase," and having every colony strong and well supplied with stores for the winter.

BITTER HONEY.



In my work in West Tennessee I found many localities where the bee-keepers were troubled with the bitter nectar that is secreted by the *helenium tenuifolium*, better known as bitter weed. This plant is an annual. It comes up from the seed the latter part of the spring and grows to a height of almost 15 inches by the middle of August, when it begins to bloom. It continues to bloom and secrete the bitter nectar until about the middle of October.

Its flowers are a deep yellow. As many as two hundred blossoms have been found on a single plant. It has about the same nature as dog fennel or horse fennel, and is usually found growing along the roadside and on waste lots.

The honey is light yellow with heavy body and soon granulates when extracted. It is very bitter, almost as bitter as quinine. It is unfit for use by man except for medicinal purposes where the bitter principle helps to disguise other ingredients. It is good for the bees to winter on, and to feed with in the early spring to stimulate brood rearing. There is no recourse left to the bee-keeper but to extract all his good honey before the bitter weed begins to bloom and then to extract the bitter honey for feeding.

INSPECTION WORK.

My inspection work began in April and continued until December 8. Six hundred and seven colonies were inspected during April and May, 216 in June, 96 in July, 70 in August, 127 in September, 40 in October, 27 in November and December. Seventy-eight colonies were infected with sac brood, 19 with American foul brood and 46 with European foul brood.

In this report it will be observed that there were not so many inspections made during the months of July, August and September as in the spring months. Inspection work during these months was largely interfered with by my extension work on the agricultural train. How-



The Bitter Weed of the South. Picture taken during the latter part of its flowering.

(Courtesy of American Bee Journal.)

ever, all calls for inspection and reports of suspected disease were given attention.

The number of reports of bee diseases have been disappointing. The fear of having their bees destroyed, or discouragement and indifference, or a lack of confidence in curative and preventative treatment, or ignorance of the apiary law has made the bee-keepers slow about reporting troubles.

All the queen breeding yards were inspected early in the spring and found free of disease with one exception. This yard was not only refused a certificate of healthy condition but clear, clean-cut instruction given for treatment. This treatment was fully carried out and we trust that next spring's inspection will show it free of disease.

TREATMENT.

The treatment required in every diseased case is given in full in the July issue of Tennessee Agriculture, beginning on page 277. At no time was my visit resented. Every bee-keeper was willing to co-operate with me.

The financial statement of the apiary inspection work is embodied in the general report of the Commissioner of Agriculture.

EXTENSION WORK ON AGRICULTURAL SPECIAL.

The agricultural special in its tour over the State afforded exceptional advantage for doing extension work in bee-keeping. The exhibit, occupying about one-third of a car, was made up of the practicable appliances in bee-keeping. It consisted of observatory and working hives, with frames filled with foundation and with drawn comb; division boards, queen excluders, Porter and LaReese bee escapes, an extractor, uncapping can, capping-melter and solar wax extractor, smokers, veils, gloves, hive tools and several styles of feeders.

A working colony of Italian bees in an observatory hive with glass sides so the bees could be seen in their movements over the combs was on exhibition through the nine weeks of the tour. Part of the time two colonies were on exhibition: one of pure-blooded Italians and the other of hybrids. These hives of live bees attracted much attention and were an interesting revelation to the thousands of people who passed through the train. A number of queen bees in small mailing cages were exhibited to show how queens are sent out from the queen yards.

Educational placards pertaining to the bee-keeping industry were conspicuous about the exhibit, and in the center stood prominently the bee-keepers' library. When the train started on its tour the honey

on exhibition was exclusively white clover, in the comb and extracted. Other varieties, such as poplar, alsike, cotton, sourwood, basswood, honey dew, bitter weed, etc., were contributed by interested bee-keepers as the train moved over the State.

DEMONSTRATION AND INSTRUCTION.

Demonstrations and instructions in bee-keeping were given in the car by the exhibit at every stop the train made. In addition to these demonstrations many open air lectures were given on the value of the honey bee in giving us predigested food and in the pollinizing of fruit bloom. Questions were invited and many were asked. Literature on bee-keeping as a practical and profitable industry was distributed to those interested.

The following list of circulars, pamphlets, bulletins, etc., gives an idea of work done in the distribution of printed matter:

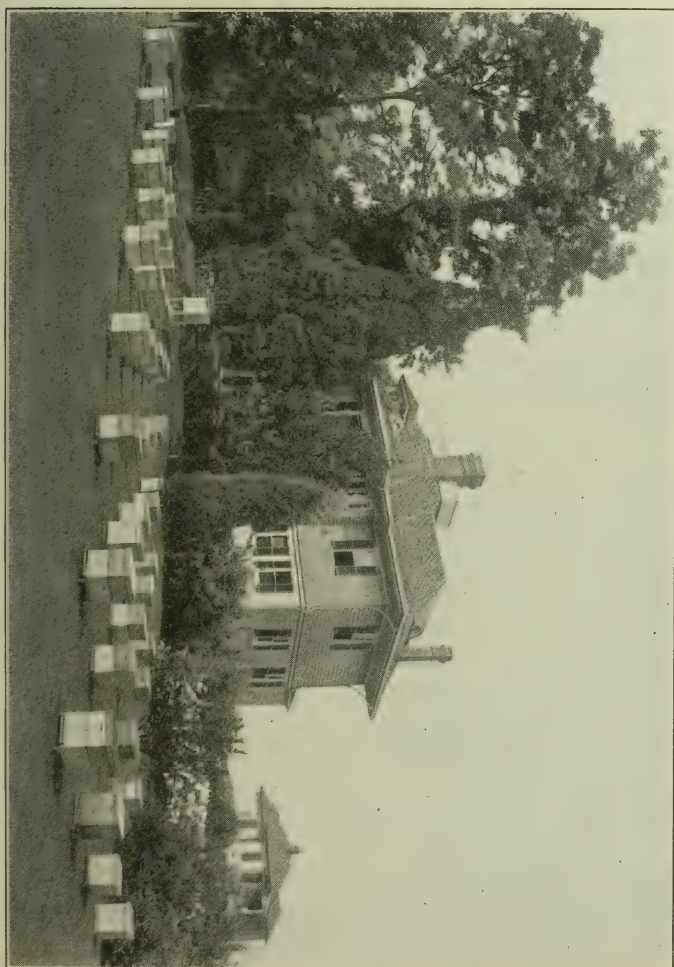
	Copies.
Bee-keeping on the Farm.....	3,000
Memoranda for Bee-keepers	10,000
Relation of Bee-keeping to Horticulture.....	1,500
Transferring in Bee-keeping	3,000
Publications in Bee-keeping	8,000
Report of Inspector, 1912.....	1,000
Report of Inspector, 1913.....	300
Honey Recipes for Cooking.....	1,500
Apiary Laws	1,000
Causes of Failure	2,000

In addition to the above, many magazines and journals on bee-keeping were contributed for distribution; also catalogues from supply houses, addresses of queen breeders, etc., etc.

The names and addresses of bee-keepers and those interested in the honey industry were gathered at every stop the train made. These have been filed, both alphabetically and by counties, for ready reference and convenience in mailing out bulletins and other literature of instruction. The mailing list of bee-keepers is now a large and valuable one.

NEED OF EDUCATION IN BEE-KEEPING.

While on the train we were particularly impressed with the need of education and instruction in bee-keeping among bee-keepers. Old and unprofitable methods should be discarded and all the practical, modern methods should be taught, so as to be able to gather the tons and tons of honey that are going to waste every year. Thousands of acres of



Experimental Apiary and Apiarian Laboratory of U. S. Government at Drummond, Md.

Tennessee soil are covered every spring with white clover blossoms, from which we get the finest of honey. This natural resource of wealth should not be allowed to go ungathered because of ignorance. According to the census report issued by the Government, Tennessee ranked third in the number of hives or colonies, but only fifth in the honey production. This low place in honey yield grows out of the fact that the majority of the 300,000 colonies in the State are kept in old-fashioned "gums" or home-made boxes, and cared for after impractical and unprofitable methods. This is not as it should be, and your Inspector of Apiaries will exert himself to develop the industry through lectures, demonstrations and the mailing of bulletins, circulars and letters of instruction.

APPROPRIATION TOO SMALL.

This educational work, however, will be much hampered by the present small appropriation. One thousand dollars falls far short of the needs to promote this industry. The annual income from honey and wax is only about \$250,000, when the available natural resources are approximately \$2,000,000.

BEE MOTH.

The question that was asked over and over again by keepers of bees as they passed through the agricultural train and in many letters that come to my address is, "How to prevent the moth?" Having to answer it so many times I epitomized it in the following short statement:

1. Use only the modern hive, so as to be able to go through it and fully understand its condition.
2. Keep all colonies strong by stimulating brood rearing and feeding or combine weak colonies. The moth never bothers a strong colony.
3. Feed each colony in the fall if they need it until each brood box with its bees and stores has a weight of about twenty pounds.

Moths in a colony are a reflection upon the bee-keeper. He is either ignorant of how to care for bees or he is indifferent and neglectful.

FEEDING.

The second question perhaps in frequency was, "How to feed bees?" The following instructions were given:

1. Feed only at night to prevent robbing.
2. Feed always on the inside of the hive. Pour the feed in a pan placed on top of the brood frames in a shallow super.

3. Feed solution of sugar if there is no honey to give back. Two parts granulated sugar to one of water for winter stores.

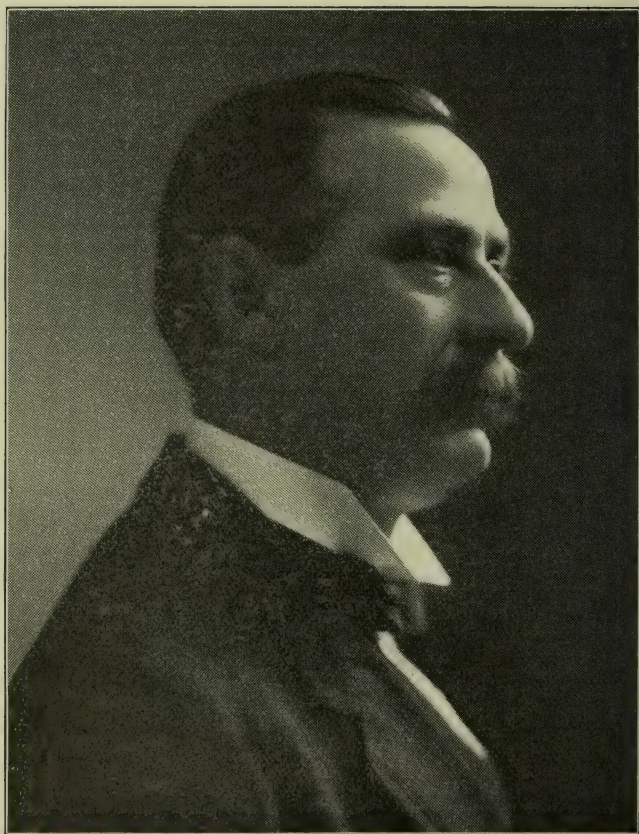
4. Feed until each brood box with its bees and stores has the weight of about fifty pounds.

For the report of the Tennessee Bee-keepers' Association, which met in January, 1914, see page 285 of the July issue of "Tennessee Agriculture."

In closing this report, I desire to most sincerely and heartily thank you, Captain Peck, for your uniform and courteous treatment, for the assistance you have given me and the interest you have always manifested in my work.

Respectfully submitted,

J. S. WARD,
Inspector of Apiaries.



J. J. B. JOHNSONIUS, Assistant Commissioner of Immigration.

REPORT OF J. J. B. JOHNSONIUS, ASSISTANT COMMISSIONER OF IMMIGRATION.

To the Honorable Commissioner of Agriculture, T. F. Peck:

DEAR SIR: During the term of 1911-1912 the Bureau of Immigration started out to advertise the wonderful opportunities and resources of the State of Tennessee and to invite the homeseeker's attention to the splendid market facilities, the fertile soil, unsurpassed climatic conditions, possibilities in diversified farming, cheap lands and other advantages offered in this State.

During that term the bureau was handicapped by the limited appropriation made for that purpose. However, much good was done by the circulation of descriptive literature as well as by exhibits which were carried into several states of the Union, especially into Missouri, Iowa, Illinois, Indiana and Ohio. Considerable results were had from these trips, but the fact that at the expiration of the term the bureau found itself absolutely without one cent for over six months made it impossible even to follow up a good deal of the already started work, caused considerable loss and was quite a backset to the work. Furthermore, contrary to your recommendation expressing the advice of a more liberal appropriation for immigration work, the Legislature of 1913 cut down the entire amount to be used for this work for this term \$2,800, making the entire amount \$7,200 for the two years. Anyone who knows the cost of advertising will realize the absolute inadequacy of this amount, and small results could certainly be expected with so small a sum.

Incidentally it may be stated that no State in the Union trying to do any immigration work makes as small an appropriation as Tennessee to advertise the possibilities and resources.

In October, 1913, after the work had absolutely ceased for six or seven months, it was placed in charge of the writer and he at once went to points in Michigan and Indiana with a display of Tennessee's agricultural products and literature. Especially were efforts made by him in the towns of Niles, Three Rivers and Coldwater, Mich., with the result that people from each of these places have come, some to locate and others to investigate. Those who came were well pleased with what they saw, as evidenced by letters and by the fact that some bought and others took options on lands here. Another large amount of literature was produced and inquiries from all over the United States were promptly answered.



Tennessee Bureau of Immigration.

The drought of the summer of 1914, followed by the difficulty in selling property and apparent scarcity of ready money, has kept many who have fully made up their minds to locate in Tennessee from coming, and from inquiries coming in at present the prospect for an increased immigration of desirable farmers appears to be exceedingly good.

Under the present circumstances it has been the opinion of the ones in charge of the work that no efforts should be made at present to get any homeseekers for Tennessee except such as expect to engage in agriculture. To bring in mechanics, factory hands and laborers would not only be assuming a grave responsibility, but would also be an injustice toward many citizens of our State, who are at present scarcely able to procure labor sufficient to support them.

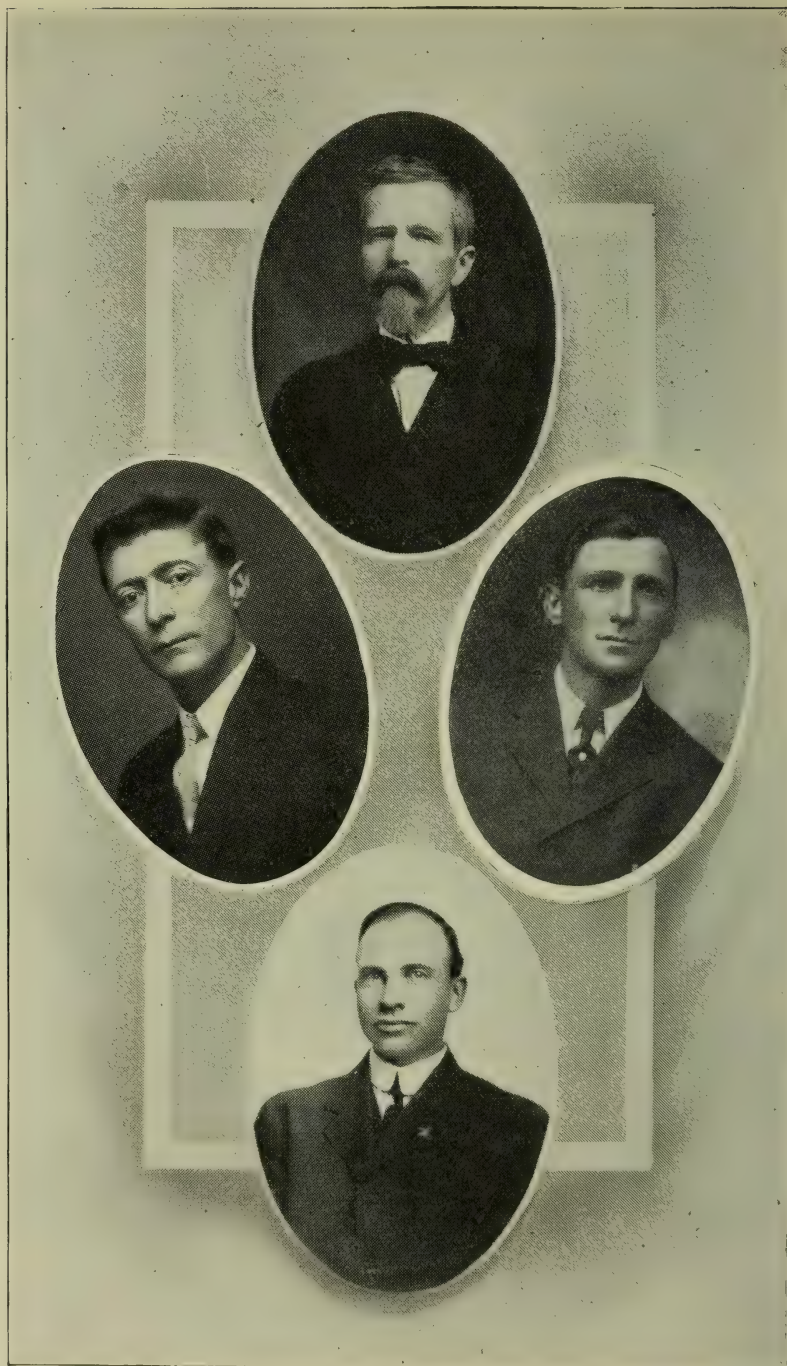
There are many good men raised on the farm who, by the lure of high wages in the factories and workshops, have come to the cities to find that city life is not as desirable as they thought and who are anxious to return to the land. There should be an intelligent effort made by the business organizations of the cities to find such people and through the cooperation of this Department many might be located where they can become producers as well as consumers.

While there is room for all good citizens who want to come to Tennessee, and while we fully realize the desirability of additional good farmers from other sections, let us remember that in locating the needy city laborer upon the land that needs the labor we are doing a double work, helping both the country and the city.

Sincerely hoping that the next Legislature may see the importance of this work and that they may make a suitable appropriation for the purpose of building up and advertising our great State, I remain,

Yours respectfully,

J. J. B. JOHNSONIUS,
Assistant Commissioner of Immigration.



JESSE TOMLINSON,

Assistant Commissioner of Agriculture for Middle Tennessee.

R. T. DEBERRY,

Assistant Commissioner of Agriculture
for West Tennessee.

J. A. DINWIDDIE,

Assistant Commissioner of Agriculture
for East Tennessee.

PROF. G. M. BENTLEY,

State Entomologist and Plant Pathologist.

REPORTS OF ASSISTANT COMMISSIONERS OF AGRICULTURE.

J. A. DINWIDDIE, ASSISTANT COMMISSIONER FOR EAST TENNESSEE.

Capt. T. F. Peck, Commissioner of Agriculture.

SIR: I herewith submit report of my institute and community cooperation work for the year 1914.

During the month of January, 1914, I held successful meetings at Athens, Dandridge, Morristown, Church Hill and Newport and attended the Farmers' Conference at Nashville on January 26 and 28. I made addresses at these meetings, which included boys' corn club meetings at Greeneville and Jonesboro and farmers' clubs at other places mentioned.

In February I attended a farmers' meeting at Chattanooga on the 2d, addressed an audience of 300 at Johnson City Normal on the 5th, addressed meetings at Mosheim, Cookeville, Morristown, Stony Point and Bluff City. All these meetings were well attended.

In March I attended and addressed meetings at Elizabethton, Tellico Plains, Greeneville, Afton, Sparta and attended a poultry meeting at Lebanon on the 27th.

In April I attended and addressed meetings at Newport, Morristown, Afton, Elizabethton and Rogersville. On April 7, 8 and 9 I attended the Southern Education Congress at Louisville, Ky., and on the 29th a poultry conference at Morristown.

In May large meetings were attended and addressed at Jonesboro, Greeneville, Afton, Stony Point, Rogersville, Newport, White Pine, Chattanooga, Cleveland, Sweetwater, Bulls Gap and Pleasant Grove. On May 18 to 21 I attended the meeting of the East Tennessee Farmers' Institute at Knoxville and made an address on poultry breeding.

In June I attended and addressed meetings at Hunters Station, Elizabethton, Bluff City, Greeneville, Persia Junction, Church Hill, Rutledge, Cedar Grove, Cleveland, Mascot and Morristown. All these meetings were well attended and had interesting programs.

The first two weeks of the month of July were devoted to advertising the agricultural special in East Tennessee, and on the 16th I joined the train at Mt. Juliet, Tenn., and took charge of the poultry exhibit and made talks on subjects of poultry at many of the stops of the train. The month of August was spent on the agricultural special up to the 13th. During the balance of the month I held meetings at Cedar Grove and Limestone and attended a meeting at Chattanooga on August 29.

During the month of September I attended and addressed meetings at Dandridge, Church Hill, Clay Valley, Bristol and Elizabethton. These meetings were well attended and much interest shown. From September 10 to 15 I was again with the agricultural special train. During the balance of the month I attended meetings at South Pittsburg, White Pine, Cumberland, Oak Grove and Rutledge.

During October I attended and addressed meetings at Byington, Newport, Rogersville, Telford, Cedar Grove, Church Hill, Eidson and Blaineville. On October 6 and 7 I attended the Middle Tennessee Farmers' Institute and made addresses on poultry breeding and feeding.

Meetings were attended during the month of November at Corryton, Dandridge, Oakland, Harriman, Kingston, Afton, Cumberland Gap and Maryville. On November 21 I addressed the corn club and tomato club meeting at Knoxville.

During the year I have organized community cooperative clubs at the following places:

Hunter Station—R. E. May, President; J. K. Sharp, Secretary.

Afton—J. C. Cook, President; A. F. Jewal, Secretary.

Bluff City—J. C. Brown, President; J. C. Mauk, Secretary.

Stony Point—R. A. Armstrong, President; Dr. Lyons, Secretary.

Dandridge—J. A. Dinwiddie, President; J. A. Farmer, Secretary.

Rutledge—R. E. Foster, President; Sam Foust, Secretary.

Cedar Grove—J. H. Jones, President; Sam Vance, Secretary.

Morristown—J. H. Holmes, President; F. Roger Miller, Secretary.

At some of the meetings when these clubs were organized considerable enthusiasm was shown and I believe that most of the clubs organized will grow and prosper.

Respectfully submitted,

J. A. DINWIDDIE,

Assistant Commissioner of Agriculture for East Tennessee.

JESSE TOMLINSON, ASSISTANT COMMISSIONER FOR MIDDLE TENNESSEE.

To the Honorable T. F. Peck, Commissioner of Agriculture for Tennessee.

DEAR SIR: The following is a detailed report of my work for the past two years as Assistant Commissioner of Agriculture for Tennessee:

Up to June, 1913, most of my work was in the capacity of fertilizer

inspector. The details of this work have been reported by my successor, A. L. Garrison, in his Fertilizer Bulletin of 1913. While performing the duties of fertilizer inspector, I also conducted various farmers' institutes and assisted in a number of agricultural meetings. As these have been reported in a former publication of your Department, they will not be included in this report.



Crowd at Agricultural Special at McConnell, on Illinois Central Railroad.

In the summer and fall of 1913 I conducted the following one-day farmers' institutes:

Places	No. of Lectures	Attend- ance
Waynesboro	6	150
Linden	6	200
Chapel Hill	8	150
Lafayette	6	75
Gainesboro	8	300
Celina	5	100
Byrdstown	5	75
Jamestown	5	300
Clarkrange	3	30
Spencer	3	25
Tracy City	3	100
Crossville	8	400
Dover	4	150

Places.	No. of Lectures.	Attend- ance.
Livingston	5	200
Woodbury	3	30
Lebanon	6	200
Cornersville	6	150

During the winter and spring of 1914 I visited and made talks to various clubs, schools and county courts.

In April, 1914, I attended a three days' conference at Louisville, Ky., after which, until July 15, my entire time was devoted to the organization of the following rural cooperative clubs:

Place.	Chairman.	Secretary	County.
Aspen Hill			Giles.
Brick Church	J. L. Blackman..	Justin Leonard..	Giles.
Isoms (Hampshire) ...	Sam Brooks.....	J. V. Delk.....	Maury.
Cross Bridges (Co- lumbia)	Jno. Brooks.....	H. H. Hill.....	Maury.
Sawdust Valley (Co- lumbia)	A. C. Allen.....	E. C. Kinney....	Maury.
Sullivan School House (Culleoka)	M. Murphy.....	J. W. Mathews..	Maury.
Hampshire	V. A. McClanna- han	Tom Brooks.....	Maury.
McCains (Columbia) ..	R. F. Egnew.....	E. A. Hineman..	Maury.
Lebanon		W. E. Baird.....	Wilson.
LaFayette	T. A. Fishburn..	J. B. Freeman...	Macon.
Buffalo Valley	Sam Denton.....	R. S. Curr.....	Putnam.
Algood	T. J. Clark.....		Putnam.
Orlinda	Wm. McNeely...	H. G. Gilbert...	Robertson.
Adams	H. R. Head.....	W. R. Rosson...	Robertson.
College Grove	A. R. Parks.....	N. P. Warren...	Williamson.
Leiper's Fork	C. O. Shaw.....	W. A. Southall...	Williamson.
Oak Grove	M. Peden.....	Bonner Ray.....	Sumner.
Collinwood	T. A. Atkinson..	A. L. Burnett...	Wayne.

From the 15th of July to the 17th of September my time was devoted to the agricultural special train.

Since then I have attended the State Fair, the Middle Tennessee Division Institute and other institutes.

Respectfully submitted,

JESSE TOMLINSON,

Assistant Commissioner of Agriculture for Middle Tennessee.

R. T. DEBERRY, ASSISTANT COMMISSIONER FOR WEST TENNESSEE.

Captain T. F. Peck, Commissioner of Agriculture:

DEAR SIR: I beg leave to submit the following report of my work

as Assistant Commissioner of Agriculture for the biennial period, 1913-1914.

The opening of this term was largely given over to my duties of inspection of the fertilizers which were being shipped into the western division of the State, securing during this period samples of one hundred and fifty-three different brands, most of them showing varying analyses, put on the market by the manufacturers of our own and other States.

These samples represented total shipments into this division of, in round numbers, twenty thousand tons of complete mixtures.

An examination of the bulletin showing the tabulated official



Lespedeza Farm, Hickory Valley, Tenn.

analyses of these different samples shows that practically all of them were well within the three per cent margin allowed them under our laws, but many of them showed a shortage in the higher priced nitrogen, making up the deficiency thus caused in commercial value in the lower priced potash and phosphoric acid-bearing materials.

As nitrogen is the determining factor in crop production on most of the soil in our State, I think that it would be well if some amendment were made to our fertilizer laws requiring the manufacturer to guarantee within a reasonable limit the exact amount of each element contained in his goods, and should not be allowed to make up from lower priced and less needed elements the commercial value of his product, as these will not produce the increased yield that might be

expected from the mixture as guaranteed, some brands showing nearly or quite one per cent loss on a guarantee of nitrogen.

In addition to taking samples of the different fertilizers offered for sale in this division, much educational work in regard to the proper use of commercial fertilizers was done during this period among the agents handling the goods, and also among the parties purchasing for their own use. I found that many of the agents handling the fertilizers did not even know how many pounds of plant food they were getting in a ton of any given brand but had purchased because it was called wheat or corn or cotton grower, as the case might be, and none of the users knew whether he was buying something to grow leaf, stalk or fruit, but was buying because the agent or some neighbor had recommended that particular brand for the crop that he wanted to grow.

Under the haphazard system of buying in the past I am pretty sure that the average purchaser of complete commercial mixtures for use on general farm crops has not gotten his money back, to say nothing of a profit on his investment, but while all this is true there is no question in my mind but that the judicious use of the proper mixtures will very greatly aid any farmer in producing profitable crops and at the same time render him material aid in keeping up the fertility of his soil. But this use must be in connection with some systematic rotation of crops in which the legumes come in their proper turn, and by taking the necessary nitrogen from the air allow the farmer to confine his purchases to the less costly elements of potash and phosphoric acid.

I am pleased to note that recently our farmers are beginning to purchase by the analysis guaranteed rather than by the brand name, as formerly, and are also coming to have a much more intelligent comprehension of how to use the mixtures in the proper amounts and to the best advantage, and they will be able to make a still more economical and intelligent use of these materials when they understand that we have a sufficient supply of potash in most of our soils and can get all of the nitrogen from the air through the growing of leguminous plants, such as peas, soy beans, vetches and the different clovers, leaving only phosphoric acid to be supplied from some outside source.

Since the fertilizer season my work has been altogether along the line of institute and short course in agricultural work. The first short course that I attended after having transferred my activities to that line was at Etowah, McMinn County, the home of our efficient Commissioner of Agriculture, Capt. T. F. Peck. This was during

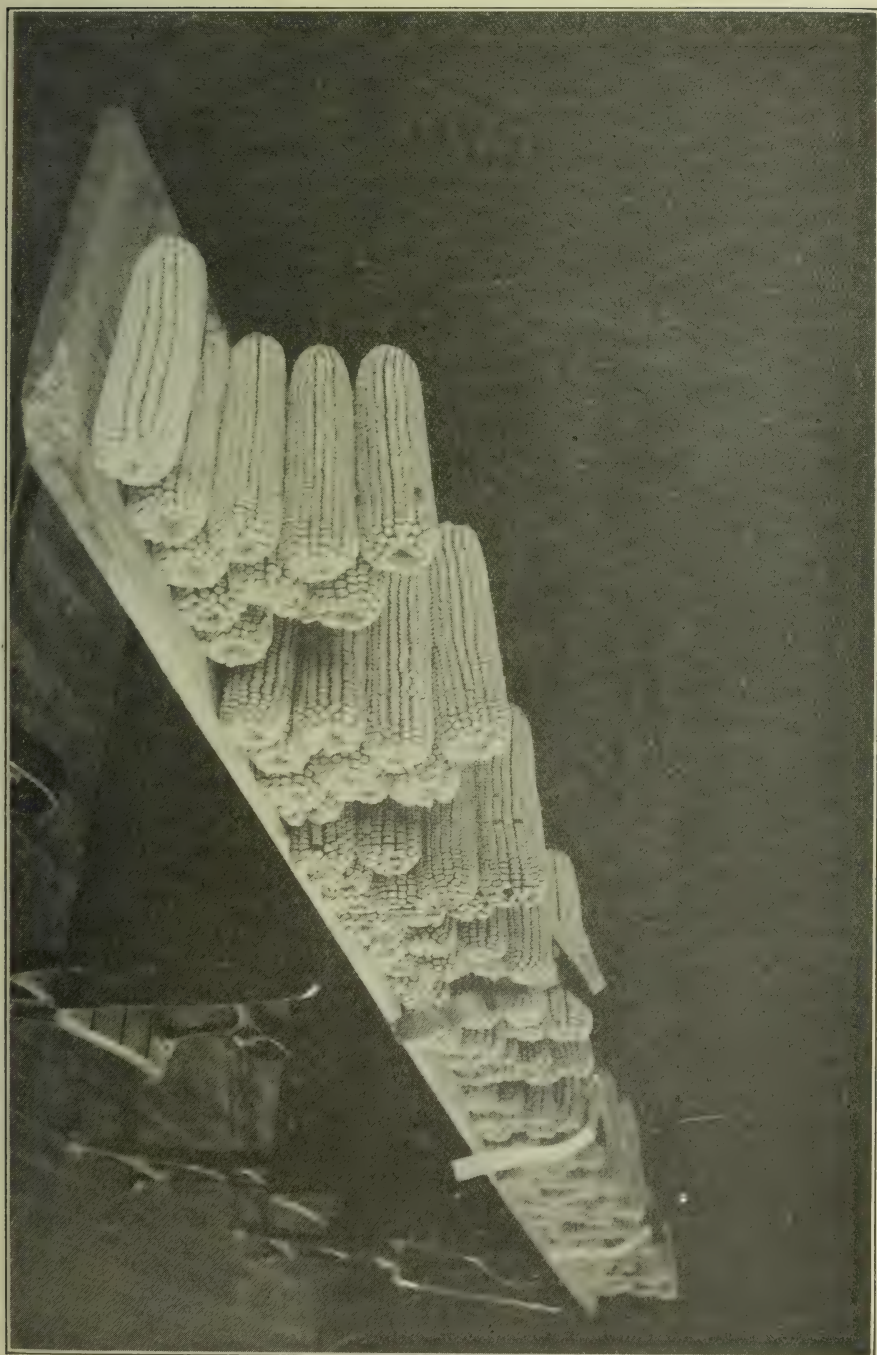


Exhibit of Good Seed Corn.

the month of March, 1913, and a daily attendance of about 75 people received the benefit of this work, which was done by Capt. Peck, Prof. H. A. Morgan, Profs. Mooers, Bentley, Pridmore, Jacobs, Dr. G. R. White, A. L. Garrison, myself and others.

My work of taking samples was finished May 1, 1913, but owing to the serious illness of my wife, whose death occurred on May 14 of that year, I was unable to give any time to my institute work until June, following, during which month I attended a number of farmers' rallies held on the grounds of the Experiment Station at Jackson. These rallies were worked up by the U. S. Demonstration Agents in the various counties, acting under the supervision of Mr. H. S. Nichols, and affording me an excellent opportunity for the discussion of a number of topics in which the farmers of this section are interested, and probably 1,500 to 2,000 farmers were reached at these different meetings. I am indebted to Mr. H. S. Nichols for the courtesy of an invitation to each of these rallies, and also for providing a place for me on each of the programs of these meetings. I regard these rallies as having a special value, as they combine a demonstration of what is being done along the line of improved methods of farming, and having these demonstrations discussed at length by men who are familiar with the work and the combination of object lessons and discussions makes a far more lasting impression on the minds of the hearers than a simple discussion.

Beginning in July and extending over into August, 1914, the regular round of County Farmers' Institutes was held in the various counties in West Tennessee, twenty in all being held, with an aggregate attendance of 2,000 to 2,500 people. Owing to the fact that up to this time no appropriation for institute work had been made by the General Assembly we were very much handicapped for lack of speakers, there being only three present at most of the meetings, and only one, myself, at one of them. Dr. J. S. Ward and Mr. O. M. Watson were with me the greater part of the time, while Capt. T. F. Peck was with me at Tiptonville, Lake County, and Paris, Henry County, and Mr. A. L. Garrison was with me at Paris. Dr. Ward discussed bee-keeping in its different phases and pointed out to his hearers the advantages to be gained from carrying them as a side line on every farm. Prof. Watson discussed live stock and soils and crops in a way that made a lasting impression on all who were fortunate enough to hear. I take this occasion of returning my profound thanks to Mr. Watson for the efficient aid rendered me in making this round of institutes a success, and his efforts were all the more appreciated

because of the fact that he did this work without any remuneration whatever.

The season's work in institutes was brought to a fitting close with the meeting at Jackson, of the West Tennessee Farmers' Institute, the regular annual division institute for this section, at which 2,000 farmers were in attendance. An excellent program was well carried out, giving a stimulus to better farming methods, the results of which are seen in the good crops which have been grown this season in spite of the worst drouth that has prevailed in several years, a drouth the duration of which would have reduced the yield to less than half what it is if the old methods of cultivation which were in vogue even five years ago had been practiced.

During the fall of 1913 I attended a number of field demonstration meetings, which were held under the auspices of the U. S. Department of Agriculture, these meetings being worked up by the Demonstration Agents of the various counties and actual demonstrations of fall breaking and preparing lands for crops the ensuing spring were given. Ordinary mold board breaking plows were used in some of these demonstrations, while in others the ordinary plow was followed by a subsoil plow, and in yet others disc plows of different makes were used, thus giving the spectators an opportunity for seeing and comparing the relative merits of the various methods used in breaking lands in the fall. In addition to this actual work, talks were made on the advantages offered by the methods employed, it being pointed out to the listeners that any man might by cooperation with his neighbors employ any of these means of breaking his lands in the fall without excessive cost to either in the operation.

Stress was also laid upon the fact that any of these methods of deep breaking would prevent washing of the land and allow the water falling upon the surface during the late fall and winter to penetrate to a depth sufficient to enable the farmer to conserve this moisture for the use of his crop the following spring and summer. It was further pointed out that as air is one of the greatest agents known for rendering compounds of the different elements of plant food in the soil available for the use of plants, that this deep breaking in the fall would give the air a much better chance for acting on these compounds and converting them into forms more readily available than if all preparation were left until such time as it was desired to plant the crop.

Six short courses in agriculture were held, under the auspices of the Tennessee State College of Agriculture, in West Tennessee, during

the winter, at the following named places: Camden, Benton County; Union City, Obion County; Ripley, Lauderdale County; Covington, Tipton County; Somerville, Fayette County, and Dresden, Weakley County. These short courses lasted six days at each place and covered a wide range of topics, greatest stress being laid upon those in which that particular community was most interested, more attention being paid on the whole to general farm crops and live stock, as these were of more general interest than any others. Quite a good deal of discussion was given to truck growing and small fruits, as the interest in these lines is growing throughout this division, and all the discussion of truck growing was given over to the writer, and the industry was considered in every detail, from the making of the beds necessary for growing the plants on up to marketing of the crops grown.

The strawberry industry in this section is growing, probably 200 cars more being shipped this season than last year, and I think that my own efforts to increase the acreage devoted to this crop are beginning to show some results. Dresden, where practically none were grown three years ago, shipped out seven cars this past season. With this start there is no reason why the business at that point should not grow by steady increase from year to year until the limit of the ability of the people in that community to handle them has been reached.

In the summer and fall of 1913 one-day institutes at Gainesboro, Jackson County; Crossville, Cumberland County; Mountain City, Johnson County; Elizabethton, Carter County; Erwin, Unicoi County, and Jonesboro, Washington County, were attended, the attendance at the first two places being excellent, that at the other places mentioned being light, due, I think, to lack of previous advertising.

During the winter of 1913-1914 Prof. H. A. Morgan called my attention to the fact that the University of Tennessee authorities had on hand the sum of \$3,000 which they were going to expend in the erection of a building suitable for the storing of the implements used on the farm at the West Tennessee Experiment Station, and suggested that this would be an opportune time for taking up the matter with the farmers of this section and get them to agree to pay one dollar for each delegate attending the regular division institute, until a sufficient sum had been paid that, combined with the money furnished by the station, an auditorium of seating capacity to comfortably provide for all of the delegates who might attend be erected, the auditorium being arranged with gradually rising seats in order that space might be left

under and behind the seats to provide storage space for all implements that may be used on the station farm.

The successful carrying out of this plan meant securing ample accommodation for housing the visitors at the regular annual meeting at about one-half the cost that would accrue were the delegates to attempt to build without the fund from the university, and without in any way detracting from the value of the building as a place of meeting.

This matter was immediately taken up with the farmers, and the responses being favorable, Prof. Morgan and myself, acting as a building committee, proceeded to let the contract for the erection of a suitable building, and the same is now nearing completion. The building when finished will be about 135 feet long, 85 feet wide, elliptical in form, and will when used to its full capacity seat about 1,600 people. The structure will be of steel frame, wooden construction, covered with ten-year guaranteed asbestos roofing, and will cost \$7,575, all told, without furnishings. This building will stand for years as a monument not only to what may be done by cooperation but also to the public spirit and progressive views of the farmers of West Tennessee.

Provisions have been made in the center for all sorts of demonstration in the way of live stock judging without the delegates having to leave their seats to be able to see what is going on in the arena.

Last May I attended the East Tennessee Farmers' Convention and Institute at Knoxville, and the one for Middle Tennessee in December, both these meetings being well represented by delegates from the various counties of the respective grand divisions, probably 2,000 to 2,500 people being present at different times during the sessions.

In July of the present year the matter of advertising the agricultural special train, which was to be run under the auspices of the Commissioner of Agriculture, was taken up, the territory in West Tennessee being divided for this purpose between Mr. A. M. Stout and myself. Judging from the numbers of people who were present at the different stops made by the train in this territory, this work was as well done as could have been hoped for, immense crowds greeting us at every stop except at points where the surrounding country was sparsely settled. Probably 150,000 people passed through the train and viewed the exhibits while the train was in West Tennessee, and there is no question but what the movement was an unqualified success if we are to judge from the interest shown by the attendance. Only one criticism was made of the movement, and that

was that the train did not stay long enough to give an opportunity for studying the exhibits as much as they would like to, but of course with the immense territory to be covered and the limited time in which to do the work made longer stays at each point impossible. Sixteen days were taken up in making the trip over West Tennessee, and the writer was present at each one of them, and I take this opportunity of expressing my thanks for every courtesy shown me by those who were in any way connected with the movement.

One week was spent with the train on the Southern Railway from Knoxville to Chattanooga, but our Commissioner, Captain Peck, treated me rather as a guest than as an integral part of the movement, a courtesy which I appreciated very much.

From the 10th to the 15th of August of the present year two short courses in agriculture were held, one at Lexington, Henderson County, and the other at Humboldt, Gibson County, my home town, and I attended both of these, discussing truck growing and kindred topics. The attendance was around seventy-five on an average for the two weeks.

The work for this term practically wound up with the holding of the West Tennessee Farmers' Institute at Jackson, on September 29, 30 and October 1. The attendance was not so large as at some of our former meetings, but this falling off in attendance was partly due to the late season for saving hay and partly to the demoralization of the cotton market brought about by the European war situation.

While the cotton farmers are seriously hurt at present, I think that in the long run that good will come of this trouble, as it will impress upon our farmers the necessity for greater diversification of crops and the production at home of more of the necessities of life than we have been heretofore producing.

In addition to the work set forth in detail above much time has been given to correspondence, letters asking for advice on truck growing coming not only from citizens of our own State but occasionally from those living in adjoining States, and I have attempted in every instance to furnish the inquirer the information asked for in detail when possible.

Owing to the pressure of work in getting the auditorium under way and completed at Jackson, the work of advertising and going with the agricultural special train and other work that was already on hand when I received your instructions regarding organizing community cooperative clubs, I have not been able to make any systematic attempt along this line, but have organized all of my fruit growers'

associations and institutes along the club lines suggested in your letter; that is, they cooperate in securing seeds of various sorts, the purchase of live stock for breeding purposes, the purchase of fertilizers and box timber, and I am now talking cooperative reduction of the cotton acreage and a more diversified system of farming. Now that our farmers are about through gathering the crops and this other work rounded up, I hope to make a systematic campaign in West Tennessee between now and the expiration of our term for these things.

Following are names of Presidents and Secretaries of my organizations:

Name.	Address.	County.
Laurence Foner, Pres.....	Friendship	Crockett.
J. R. Cox, Sec.....	Alamo	Crockett.
Asa Mann, Pres.....	Brownsville	Haywood.
F. R. Ogilvie, Sec.....	Brownsville	Haywood.
H. P. Keller, Pres.....	Ripley	Lauderdale.
Knox Walker	Ripley	Lauderdale.
L. D. Spight, Pres.....	Trenton	Gibson.
F. R. Dennison, Sec.....	Trenton	Gibson.
J. R. Black, Pres.....	Bolivar	Hardeman.
J. A. Algood, Sec.....	Bolivar	Hardeman.
L. R. McCollum, Pres....	Henderson	Chester.
F. P. Kyle, Pres.....	Warren	Fayette.
W. M. McFaddin, Sec....	Somerville	Fayette.
A. K. Wells, Pres.....	Obion	Obion.
J. B. Skinner, Sec.....	Union City	Obion.
Allan Sharp, Pres.....	Greenfield	Weakley.
W. D. Brasfield, Sec.....	Dresden	Weakley.
C. E. Dummond, Pres....	McLemoresville	Carroll.
Albert Crider, Sec.....	Huntingdon	Carroll.
Jno. Routon, Pres.....	Paris	Henry.
Jno. Richardson, Sec....	Paris	Henry.
W. I. Crawford, Pres....	Decaturville	Decatur.
C. J. Jordan, Sec.....	Parsons	Decatur.
J. H. Cason, Pres.....	Lexington	Henderson.
W. V. Barry, Sec.....	Lexington	Henderson.
V. S. Bright, Pres.....	Brunswick	Shelby.
W. P. McQuiston, Sec....	Brunswick	Shelby.
P. H. Thrasher, Pres....	Selmer	McNairy.
J. W. Purviance, Sec.....	Selmer	McNairy.

In conclusion I want to say that, due to the efforts of the members of the State Department of Agriculture, the members of the State College of Agriculture, the agents of the U. S. Department, engaged in demonstration work, and the men employed by the various railroads, that farm methods and farm conditions have been very greatly improved during the three years which I have held my present position, and I expect to see much more rapid progress made along these lines in future than has been made in the past.

Respectfully submitted,

R. T. DEBERRY,

Assistant Commissioner of Agriculture for West Tennessee.

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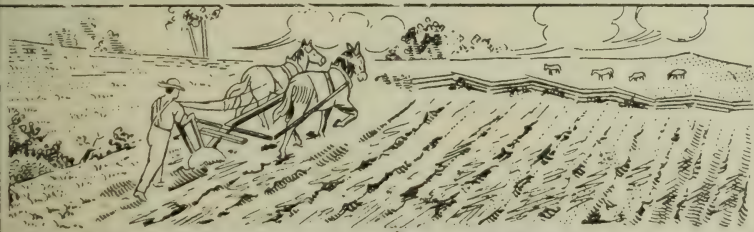
Concentrated Commercial Feeding Stuffs.

Feed Control Law.

Importance of Seed Selection.

Pure Foods.

Decoration of the Home.



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THOMAS F. PECK, Commissioner

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FEBRUARY 1, 1913.

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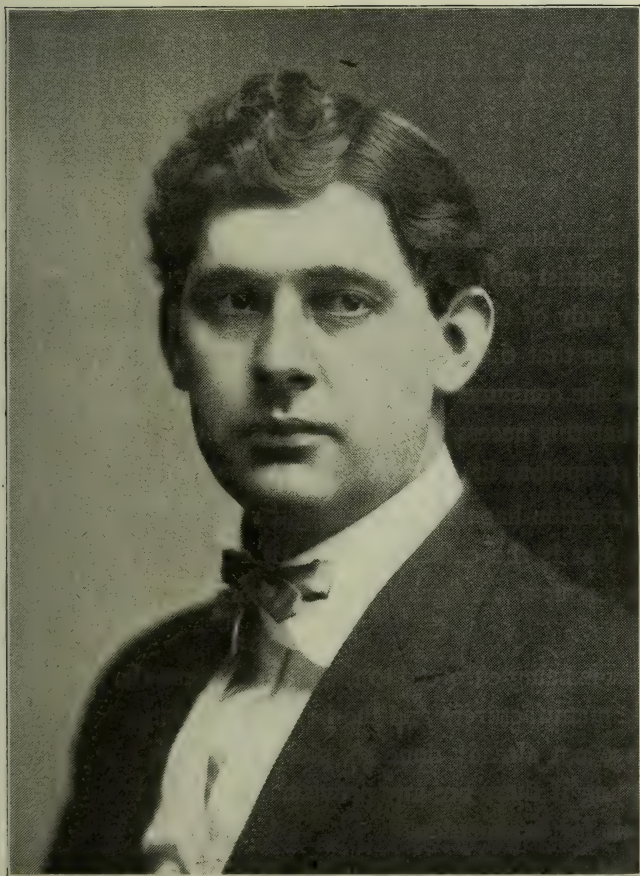
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A. L. GARRISON,
Chief Feed and Seed Inspector.

CONCENTRATED COMMERCIAL FEEDING STUFFS.**Report of the Chemist on Official Samples Furnished by
the Department of Agriculture to February 1, 1913.**

COMPILED BY A. L. GARRISON, CHIEF FEED AND SEED INSPECTOR.

(Feeding Stuffs Bulletin, No. 4.)

I am submitting in this issue of Tennessee Agriculture a report from the chemist on 130 feed stuff samples furnished by this Department. A study of this report will justify the prediction made in previous reports that the feed stuff trade in this State is in such a condition that the consumer has a just right to congratulate himself upon the fact that this necessary commodity is being furnished by so high-class and scrupulous line of manufacturers and millers as we now have.

This condition has not been brought about by any one force working alone, but is the culmination of an organized effort on the part of the Department of Agriculture, the honest manufacturers and the consumer.

The law is being enforced to the letter. It has the respect and good will of the manufacturers and the hearty cooperation of the consumer. If you have not already done so, please read the law printed herein. After reading if there are any provisions that are not clear, write this Department for explanation.

The seed law is also printed in full in this bulletin. Every farmer in the State should know and be familiar with its every provision. A knowledge of this law by the farmers of the State means many thousand dollars in increased production.

Within the next few months the Department hopes to have fully equipped a well organized chemical laboratory, in which all feed, seed and fertilizer analyses can be made, and, in addition, soil and water analyses.

LIST OF MANUFACTURERS AND MILLERS FROM WHOM
SAMPLES WERE TAKEN.

Andrew Caine, Athens, Tenn.
Athens Roller Mills, Athens, Tenn.
American Steam Feed Co., Nashville, Tenn.
Armorburg & Co., St. Louis, Mo.
Allneeda Mills Co., East St. Louis, Ill.
American Cotton Oil Co., Memphis, Tenn.
Aunt Patsy Poultry Feed Co., Memphis, Tenn.
C. R. Baird & Co., Chattanooga, Tenn.
F. W. Brode & Co., Memphis, Tenn.
Belvidere Milling Co., Belvidere, Tenn.
Cleveland Milling Co., Cleveland, Tenn.
Cedar City Mills, Lebanon, Tenn.
Clinton Milling Co., Clinton, Tenn.
Cleveland Coal and Feed Co., Cleveland, Tenn.
Cairo Milling Co., Cairo, Ill.
Cornelius, Newbill & Co., Nashville, Tenn.
Cookeville Roller Mills, Cookeville, Tenn.
Cornfalfa Feed Milling Co., St. Louis, Mo.
Clark-Burkle Co., Memphis, Tenn.
Dayton Milling Co., Dayton, Tenn.
Domestic Flour Milling Co., Kansas City, Mo.
E. A. Dorris & Sons, Nashville, Tenn.
J. & S. Emison & Co., Vincennes, Ind.
Excelsior Feed Milling Co., St. Joseph, Mo.
Eagle Flouring Mill Co., Sweetwater, Tenn.
Edgar Morgan Co., Memphis, Tenn.
Farrar & Sharp, Mulberry, Tenn.
Fayetteville Milling Co., Fayetteville, Tenn.
Georgetown Milling Co., Georgetown, Tenn.
Gordonsville Milling Co., Gordonsville, Tenn.
Hickman Milling Co., Hickman, Tenn.
Englewood Milling Co., Englewood, Tenn.
International Sugar Feed No. 2 Co., Memphis, Tenn.
Jones & Rogers, Memphis, Tenn.
Lenoir City Roller Mills, Lenoir, Tenn.
Lexington Roller Mills, Lexington, Ky.
Liberty Mills, Nashville, Tenn.
Leeper Roller Mills, Kizer, Tenn.
Leavenworth Milling Co., Leavenworth, Kansas.
Lebanon Feed & Grain Co., Lebanon, Tenn.

Madisonville Flouring Mills, Madisonville, Tenn.
McKay, Reece & Co., Nashville, Tenn.
Morehead & Young, Nashville, Tenn.
McLemore, Crutcher & Co., Nashville, Tenn.
Marshall & Maury Milling Co., Hardison Mills, Tenn.
W. D. Moon & Co., Memphis, Tenn.
Mountain City Mill Co., Chattanooga, Tenn.
Model Roller Mills Co., Cleveland, Tenn.
National Feed Co., St. Louis, Mo.
Omaha Alfalfa Milling Co., Omaha, Nebr.
M. C. Peters Mill Co., Omaha, Nebr.
Peoples Roller Mills, Madisonville, Tenn.
Pulaski Roller Mills, Pulaski, Tenn.
Pond Creek Mill & Elevator Co., Pond Creek, Okla.
Purity Oats Co., Keokuk, Iowa.
G. E. Patteson & Co., Memphis, Tenn.
Pease & Dwyer Co., Memphis, Tenn.
Quaker Oats Co., Chicago, Ill.
Riverside Mills, Nashville, Tenn.
Richland Mills, Cole, Tenn.
Raines, Connell & McFadden, Memphis, Tenn.
Superior Feed Co., Memphis, Tenn.
Scott County Milling Co., Dexter, Mo.
Skyrest Milling Co., Cleveland, Tenn.
Straw Plains Milling Co., Straw Plains, Tenn.
Standard-Tilton Milling Co., St. Louis, Mo.
Southern Cotton Oil Co., Atlanta, Ga.
Tennessee Mill Co., Estill Springs, Tenn.
Tennon Mills, Riversburg, Tenn.
Tennessee Fiber Co., Memphis, Tenn.
Tennessee Cotton Oil Co., Memphis, Tenn.
Universal Milling Co., Lebanon, Tenn.
Virtue Milling Co., Concord, Tenn.
Vonore Mills, Vonore, Tenn.
Valley Milling Co., Petersburg, Tenn.
Dan C. Wheeler & Co., Chattanooga, Tenn.
Jno. Wade & Sons, Memphis, Tenn.
Winchester Milling Co., Winchester, Tenn.
Watertown Milling Co., Watertown, Tenn.
J. H. Wilkes & Co., Nashville, Tenn.
Webb & Maury, Memphis, Tenn.
Yates, Donelson & Co., Memphis, Tenn.

CHEMIST'S REPORT ON COMMERCIAL FEEDSTUFF SAMPLES FURNISHED BY THE DEPARTMENT OF AGRICULTURE.

Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	SAMPLE DRAWN BY INSPECTOR	ANALYSIS	Protein Per Cent	Fat Per Cent	Fiber Per Cent	Carbohy- drates Per Cent
21	Choice Cotton Seed Meal.	American Cotton Oil Co., Memphis, Tenn.	American Cotton Oil Co., Memphis, Tenn.	Stout	Guarantee... Found	41.00 40.37	9.00 8.67	10.50 7.33	..... 26.81
11	Aunt Patsy's Poultry Feed	Aunt Patsy Poultry Feed Co., Memphis, Tenn.	Otto Schwill & Co., Memphis, Tenn.	Stout	Guarantee... Found	16.88 14.92	4.50 3.70	7.28 8.73	54.22 59.35
21	Hope Mill, Mill Feed	J. Andrew Cain, Versailles, Ky.	H. T. Mitchell, Harriman, Tenn.	Wynn	Guarantee... Found	15.00 14.13	4.50 4.59	8.50 7.52	51.00 56.49
6	Pure Wheat Middlings ..	Athens Roller Mills, Athens, Tenn.	Athens Roller Mills, Athens, Tenn.	Wynn	Guarantee... Found	17.48 12.90	4.30 4.53	3.68 4.06	55.93 64.06
5	Ever Best Stock Feed ...	Athens Roller Mills, Athens, Tenn.	Athens Roller Mills, Athens, Tenn.	Wynn	Guarantee... Found	15.00 14.22	4.00 4.05	9.20 8.65	53.00 56.57
43	Cooked Cow Feed	American Steam Feed Co., Nashville, Tenn.	American Steam Feed Co., Nashville, Tenn.	White	Guarantee... Found	26.00 26.06	7.50 6.50	14.00 14.73	10.00 37.23
12	Pure Wheat Bran	Aronburg & Co., St. Louis, Mo.	Hawks' Milling Co., Lebanon, Tenn.	White	Guarantee... Found	15.00 14.65	3.00 5.69	..... 11.40	54.00 52.51
41	Cooked Horse Feed	American Steam Feed Co., Nashville, Tenn.	American Steam Feed Co., Nashville, Tenn.	White	Guarantee... Found	11.50 14.04	5.48 6.04	8.05 10.22	60.76 54.40
33	Allneeda Hen Feed	Allneeda Mills Co., East St. Louis, Ill.	J. E. Tate & Co., Memphis, Tenn.	White	Guarantee... Found	10.41 10.18	3.28 3.42	2.24 2.67	70.62 71.11
32	Dixie Horse Feed	Allneeda Mills Co., East St. Louis, Ill.	J. E. Tate & Co., Memphis, Tenn.	White	Guarantee... Found	11.36 9.46	2.43 1.64	17.17 21.47	43.58 49.84
30	Dove Brand	F. W. Brode & Co., Memphis, Tenn.	Jones & Rodgers, Memphis, Tenn.	White	Guarantee... Found	38.62 39.49	6.00 8.23	10.00 10.70	22.00 26.38
97	Bran	Belvidere Milling Co., Belvidere, Tenn.	Rust & Hessie, Decherd, Tenn.	White	Guarantee... Found	16.58 16.76	5.26 5.05	7.17 9.05	53.04 54.06

Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	SAMPLE DRAWN BY INSPECTOR	ANALYSIS	Protein Per Cent	Fat Per Cent	Fiber Per Cent	Carbohy- drates Per Cent
59	Red Feather	C. R. Baird & Co., Chattanooga, Tenn.	C. R. Baird & Co., Chattanooga, Tenn.	Wynn	Guarantee.. Found	9.54 10.18	4.03 3.15	2.77 3.39	70.56 68.85
9	Owl Brand	F. W. Brode & Co., Memphis, Tenn.	Jones & Rodgers, Memphis, Tenn.	Stout	Guarantee.. Found	41.00 36.86	6.00 6.86	10.00 11.34	22.00 30.22
46	Tip Top Dairy Feed	Cornelius, Newbill & Co., Nashville, Tenn.	Cornelius, Newbill & Co., Nashville, Tenn.	White	Guarantee.. Found	13.00 15.36	4.00 3.73	..... 23.40	45.00 42.71
15	Mixed Feed	Cedar City Mills, Lebanon, Tenn.	Cedar City Mills, Lebanon, Tenn.	White	Guarantee.. Found	15.00 12.20	4.00 4.73	9.00 8.86	50.00 60.49
32	Mixed Feed	Cookeville Roller Mills, Cookeville, Tenn.	Duke Hotel, Cookeville, Tenn.	White	Guarantee.. Found	14.43 14.13	4.73 3.82	5.40 7.38	62.64 58.70
7	Straight Alfalfa Molasses Feed	Cornfalfa Feed Milling Co., Kansas City, Mo.	Lanier Bros., Nashville, Tenn.	White	Guarantee.. Found	9.00 9.32	1.00 2.47	25.00 18.32	45.00 48.14
9	Tip Top Dairy Feed	Cornelius, Newbill & Co., Nashville, Tenn.	Whitsett & Bush, Nashville, Tenn.	White	Guarantee.. Found	13.00 17.11	4.00 4.15	..... 20.68	45.00 61.73
14	Swine Pig Feed	Cedar City Mills, Lebanon, Tenn.	Cedar City Mills, Lebanon, Tenn.	White	Guarantee.. Found	11.00 11.50	4.00 4.34	3.00 7.09	65.00 65.00
10	Gilt Edge Feed	Cleveland Milling Co., Cleveland, Tenn.	Hall Bros. & Co., Cleveland, Tenn.	Wynn	Guarantee.. Found	14.50 14.65	4.50 5.31	7.77 8.15	54.27 55.07
12	Runner Bros. Choice Feed	Cleveland Coal & Feed Co., Cleveland, Tenn.	Cleveland Coal & Feed Co., Cleveland, Tenn.	Wynn	Guarantee.. Found	9.00 10.35	2.50 3.41	5.00 2.44	57.00 69.95
17	Bran and Shorts	Clinton Milling Co., Clinton, Tenn.	Little & Brown, Clinton, Tenn.	Wynn	Guarantee.. Found	13.00 13.27	4.00 3.74	8.00 8.16	55.00 55.58
18	Jumbo Mixed Feed	Cedar City Mills, Lebanon, Tenn.	Harriman Grain & Corn Co., Harriman, Tenn.	Wynn	Guarantee.. Found	15.00 12.72	4.00 5.30	9.00 8.71	50.00 57.04
61	Pine Leaf Middlings	Cairo Milling Co., Cairo, Ill.	C. R. Baird & Co., Chattanooga, Tenn.	Wynn	Guarantee.. Found	15.75 15.36	4.75 3.52	5.00 7.39	57.95 55.13

Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	SAMPLE DRAWN BY INSPECTOR	ANALYSIS	Protein Per Cent	Fat Per Cent	Fiber Per Cent	Carbohy- drates Per Cent
52	Corn Feed	Cedar City Mills, Lebanon, Tenn.	F. A. Hood & Co., Chattanooga, Tenn.	Wynn	Guarantee..... 9.50 Found.....10.62	7.00 4.63	6.31 3.90	50.00 64.88	
53	Shorts	Cedar City Mills, Lebanon, Tenn.	F. A. Hood & Co., Chattanooga, Tenn.	Wynn	Guarantee..... 14.00 Found.....12.81	4.50 4.03	7.50 3.22	56.00 65.90	
20	National Hen Feed	Clark, Burkle & Co., Memphis, Tenn.	Clark, Burkle & Co., Memphis, Tenn.	Stout	Guarantee..... 10.50 Found.....10.97	4.00 3.20	3.50 2.32	65.00 60.20	
24	Pure Wheat Middlings ..	Domestic Flour Milling Co., Kansas City, Mo.	Raines, Connell & McFadden, Memphis, Tenn.	White	Guarantee..... 15.00 Found.....12.62	4.00 5.46	7.00 6.25	56.00 52.19	
8	Chicken Feed	E. A. Dorris & Sons, Nashville, Tenn.	Whitsett & Bush, Nashville, Tenn.	White	Guarantee..... 8.88 Found.....10.18	2.50 3.14	2.15 1.96	67.80 68.95	
20	Dayton Feed	Dayton Milling Co., Dayton, Tenn.	H. T. Mitchell, Harriman, Tenn.	Wynn	Guarantee..... 14.04 Found.....14.48	4.98 5.98	6.70 7.68	56.50 55.57	
23	Manna Rice Special Chick Feed	Edgar-Morgan Co., Memphis, Tenn.	W. D. Morgan & Co., Memphis, Tenn.	White	Guarantee..... 11.00 Found.....13.34	3.50 2.75	4.00 4.62	65.00 64.51	
7	Bran	Eagle Flouring Mill Co., Sweetwater, Tenn.	Geo. Crow, Athens, Tenn.	Wynn	Guarantee..... 14.00 Found.....14.48	4.00 4.20	8.50 8.17	54.00 56.99	
63	Excelsior Horse Feed ...	Excelsior Feed Milling Co., St. Joseph, Mo.	Chattanooga Feed Co., Chattanooga, Tenn.	Wynn	Guarantee..... 11.51 Found.....9.21	4.10 2.62	15.00 11.12	58.41 58.32	
55	Diamond Scratch Poultry Feed	J. & S. Emison & Co., Vincennes, Ind.	F. A. Hood & Co., Chattanooga, Tenn.	Wynn	Guarantee..... 10.75 Found.....13.08	3.75 2.96	3.50 3.90	68.00 65.48	
54	Kiln Dried Sampson Feed.	J. & S. Emison & Co., Vincennes, Ind.	F. A. Hood & Co., Chattanooga, Tenn.	Wynn	Guarantee..... 10.00 Found.....10.62	4.00 2.40	8.00 12.39	65.00 52.86	
6	Jim Scratch Feed	Edgar-Morgan Co., Memphis, Tenn.	W. I. Moon & Co., Memphis, Tenn.	Stout	Guarantee..... 10.00 Found.....11.14	3.50 3.68	4.00 4.33	65.00 67.68	
35	Manna Hen Feed	Edgar-Morgan Co., Memphis, Tenn.	Edgar-Morgan Co., Memphis, Tenn.	Stout	Guarantee..... 10.00 Found.....11.14	3.50 2.78	5.00 1.92	60.00 71.70	

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34	Ceralfa Stock Feed	Edgar-Morgan Co., Memphis, Tenn.	Edgar-Morgan Co., Memphis, Tenn.	Stout	Guarantee. Found	13.00 15.62	4.00 3.57	11.50 9.12	55.00 57.98
37	Manna Sweet Feed	Edgar-Morgan Co., Memphis, Tenn.	Edgar-Morgan Co., Memphis, Tenn.	Stout	Guarantee. Found	10.00 12.08	3.00 2.58	12.00 17.70	50.00 49.10
25	Old Beck Sugar Feed	Edgar-Morgan Co., Memphis, Tenn.	Edgar-Morgan Co., Memphis, Tenn.	Stout	Guarantee. Found	8.20 10.00	2.00 2.75	12.00 10.50	55.00 58.06
89	Wheat Bran	Farrar & Shofner, Mulberry, Tenn.	A. M. McLaughlin, Fayetteville, Tenn.	White	Guarantee. Found	15.25 15.71	3.89 2.90	4.47 5.00	58.45 51.96
96	Wheat Bran	Fayetteville Milling Co., Fayetteville, Tenn.	Fayetteville Milling Co., Fayetteville, Tenn.	White	Guarantee. Found	14.50 16.85	4.00 4.50	6.00 7.90	55.35 55.47
94	Pure Wheat Shorts	Fayetteville Milling Co., Fayetteville, Tenn.	Fayetteville Milling Co., Fayetteville, Tenn.	White	Guarantee. Found	15.00 17.64	4.00 5.24	6.00 4.58	61.00 59.18
11	Mixed Bran	Georgetown Milling Co., Georgetown, Tenn.	Hall Bros. & Co., Cleveland, Tenn.	Wynn	Guarantee. Found	14.00 15.53	4.00 4.34	7.00 6.99	60.00 56.01
17	Mixed Feed	Gordonsville Milling Co., Gordonsville, Tenn.	Cookeville Grain & Feed Co., Cookeville, Tenn.	White	Guarantee. Found	14.39 15.71	4.93 5.60	6.18 7.40	56.90 56.90
18	Wheat Shorts	Hickman Milling Co., Hickman, Tenn.	Hickman Milling Co., Hickman, Tenn.	White	Guarantee. Found	15.00 16.15	4.60 4.20	7.00 4.08	50.00 62.45
19	Wheat Bran	Hickman Milling Co., Hickman, Tenn.	Hickman Milling Co., Hickman, Tenn.	White	Guarantee. Found	14.00 15.62	4.00 4.93	8.00 8.85	50.00 53.94
31	Cow Feed	International Sugar Feed Co., Memphis, Tenn.	International Sugar Feed Co., Memphis, Tenn.	Stout	Guarantee. Found	16.50 18.25	3.50 3.65	12.00 11.34	52.50 48.76
32	Chick Size	International Sugar Feed Co., Memphis, Tenn.	International Sugar Feed Co., Memphis, Tenn.	Stout	Guarantee. Found	10.00 10.62	3.50 2.31	5.00 2.38	70.00 72.40
33	Scratch Size	International Sugar Feed Co., Memphis, Tenn.	International Sugar Feed Co., Memphis, Tenn.	Stout	Guarantee. Found	10.00 11.50	3.50 3.10	5.00 4.32	70.00 69.43
21	International Poultry Feed	International Sugar Feed Co., Memphis, Tenn.	City Grain & Feed Co., Nashville, Tenn.	White	Guarantee. Found	10.00 13.08	3.50 4.43	5.00 4.00	70.00 66.09

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20	International Horse and Mule Feed	International Sugar Feed Co., Memphis, Tenn.	City Grain & Feed Co., Nashville, Tenn.	White	Guarantee..... Found.....	12.50 12.81	3.50 4.88	12.00 11.92	50.00 53.39				
4	Jersey Dairy Feed	Englewood Milling Co., Englewood, Tenn.	Englewood Milling Co., Englewood, Tenn.	Wynn	Guarantee..... Found.....	15.50 15.09	4.00 4.48	8.00 6.60	55.00 58.11				
7	Rialto	Jones & Rodgers, Memphis, Tenn.	Raines, Connell & McFadden, Memphis, Tenn.	Stout	Guarantee..... Found.....	10.50 9.60	2.00 3.64	12.00 10.85	55.00 54.94				
8	Peerless Hen Feed	Jones & Rodgers, Memphis, Tenn.	Jones & Rodgers, Memphis, Tenn.	Stout	Guarantee..... Found.....	10.00 10.97	3.50 3.97	4.00 2.56	60.00 67.06				
3	Jones' Cow Feed	Jones & Rodgers, Memphis, Tenn.	Jones & Rodgers, Memphis, Tenn.	Stout	Guarantee..... Found.....	17.00 25.80	5.00 4.59	16.00 12.16	50.00 42.28				
2	Creosus Feed	Jones & Rodgers, Memphis, Tenn.	Jones & Rodgers, Memphis, Tenn.	Stout	Guarantee..... Found.....	13.50 13.36	4.50 4.08	8.00 5.96	55.00 60.22				
14	Primo Feed	Jones & Rodgers, Memphis, Tenn.	Pease, Dwyer & Co., Memphis, Tenn.	Stout	Guarantee..... Found.....	10.50 11.43	2.00 3.52	12.00 12.14	55.00 52.63				
31	Pure Wheat Middlings	Leavenworth Milling Co., Leavenworth, Kan.	Jones & Rodgers, Memphis, Tenn.	White	Guarantee..... Found.....	16.00 16.67	4.00 4.17	8.00 6.68	55.50 58.83				
11	Universal Syrup Feed	Lebanon Feed & Grain Co., Lebanon, Tenn.	Lebanon Feed & Grain Co., Lebanon, Tenn.	White	Guarantee..... Found.....	11.50 9.41	4.75 3.35	12.00 13.18	52.00 53.06				
13	Pure Wheat Product	Leaper Roller Mills, Kyser, Tenn.	Blackburn & Davis, Lenoir, Tenn.	Wynn	Guarantee..... Found.....	15.00 14.65	4.00 3.48	8.00 5.72	55.00 60.68				
15	Lenoir City Feed	Lenoir City Roller Mills, Lenoir City, Tenn.	Glover & Stout, Lenoir City, Tenn.	Wynn	Guarantee..... Found.....	14.50 16.23	4.51 4.11	8.00 7.70	55.00 55.18				
22	Thorough Bred Feed	Lexington Roller Mills Co., Lexington, Ky.	Cook & West, Harriman, Tenn.	Wynn	Guarantee..... Found.....	16.38 14.92	4.15 3.73	6.91 8.13	59.98 58.18				
73	Pure Wheat Bran and Screenings	Liberty Mills, Nashville, Tenn.	Lackney, Broyles & Lockey, Knoxville, Tenn.	Wynn	Guarantee..... Found.....	14.50 13.78	4.00 3.77	8.00 7.60	50.00 53.67				
2	Tip Top Feed	Madisonville Flouring Mills, Madisonville, Tenn.	Madisonville Flouring Mills, Madisonville, Tenn.	Wynn	Guarantee..... Found.....	14.60 15.36	4.20 4.41	7.60 9.87	53.40 54.16				

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9	Crushed Ear Corn	Model Roller Mills, Cleveland, Tenn.	Hall Bros. & Co., Cleveland, Tenn.	Wynn	Guarantee.. Found.	7.00 8.16	3.00 3.00	8.00 8.17	60.00 67.86
67	Pure Wheat Bran	Mountain City Mill Co., Chattanooga, Tenn.	McDaniel & Ault, Knoxville, Tenn.	Wynn	Guarantee.. Found.	14.50 14.01	4.00 4.76	9.50 6.35	56.00 57.33
37	Cooked Cow Feed	McKay, Reece & Co., Nashville, Tenn.	McKay, Reece & Co., Nashville, Tenn.	White	Guarantee.. Found.	17.62 22.38	5.58 5.00	10.01 9.93	..... 48.44
38	Cooked Cow Feed	Morehead & Young, Nashville, Tenn.	Morehead & Young, Nashville, Tenn.	White	Guarantee.. Found.	26.00 21.50	7.00 5.12	44.00 11.97	40.00 44.44
40	Cow Feed	McLemore, Crutcher & Co., Nashville, Tenn.	McLemore, Crutcher & Co., Nashville, Tenn.	White	Guarantee.. Found.	21.75 14.22	5.46 3.45	14.36 13.27	41.34 51.29
98	Mixed Bran	Marshall & Maury Milling Co., Hardison Mills, Tenn.	Lewisburg Grain Co., Lewisburg, Tenn.	White	Guarantee.. Found.	15.75 15.97	4.22 5.43	8.35 7.37	56.24 55.74
12	Moon Sugar Feed	W. D. Moon & Co., Memphis, Tenn.	W. D. Moon & Co., Memphis, Tenn.	Stout	Guarantee.. Found.	11.65 11.40	3.00 2.96	11.04 14.77	64.00 51.84
60	Pure Hominy Feed	National Feed Co., St. Louis, Mo.	C. R. Baird & Co., Chattanooga, Tenn.	Wynn	Guarantee.. Found.	8.50 11.85	7.00 3.36	10.00 2.25	..... 67.69
56	Perfection Horse Feed	Omaha Alfalfa Milling Co., Omaha, Nebr.	Shelton Grain & Feed Co., Chattanooga, Tenn.	Wynn	Guarantee.. Found.	10.50 13.18	2.00 3.77	12.00 11.55	55.00 52.96
43	Perfection Horse Feed	Omaha Alfalfa Milling Co., Omaha, Nebr.	John A. Tyner & Co., Nashville, Tenn.	White	Guarantee.. Found.	10.50 11.36	2.00 2.59	12.00 11.56	55.00 53.55
1	Mixed Bran	Pulaski Roller Mills, Pulaski, Tenn.	Pulaski Roller Mills, Pulaski, Tenn.	White	Guarantee.. Found.	15.09 13.60	2.87 4.62	12.29 6.98	51.25 59.99
27	Champion Stock Feed	G. E. Patteson & Co., Memphis, Tenn.	Clark, Burkle & Co., Memphis, Tenn.	Stout	Guarantee.. Found.	11.65 12.65	3.50 2.90	11.04 13.86	64.00 50.04
26	Pure Wheat Bran	Pond Creek Mill & Elev. Co., Pond Creek, Okla.	Pease, Dwyer & Co., Memphis, Tenn.	White	Guarantee.. Found.	16.06 14.13	3.50 4.84	10.90 8.50	50.35 58.25
44	Reground Oat Hulls	Purity Oats Co., Keokuk, Iowa	White	Guarantee.. Found. 6.58 2.83 27.22 49.72

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4	Sugar Ration Stock Feed.	G. E. Patteson & Co., Memphis, Tenn.	Acme Stock & Poultry Sup- ply Co., Nashville, Tenn....	White	Guarantee...11.65 Found.....10.66	3.00 2.85	11.04 8.19	64.00 62.36	
16	Optimo Feed	Pease, Dwyer Co., Memphis, Tenn.	Pease, Dwyer Co., Memphis, Tenn.	Stout	Guarantee...12.50 Found.....12.81	4.50 4.08	7.00 5.30	60.00 63.75	
15	Premo Mixed Hen Feed...	Pease, Dwyer Co., Memphis, Tenn.	Pease, Dwyer Co., Memphis, Tenn.	Stout	Guarantee...10.00 Found.....11.32	3.50 3.16	5.00 3.29	60.00 69.33	
16	Crabb Horse Feed	M. C. Peters Mill Co., Omaha, Nebr.	Neil & Cash, Knoxville, Tenn.	Wynn	Guarantee...9.00 Found.....9.60	2.00 1.76	15.00 9.10	59.00 58.02	
1	Peoples' Feed	People's Roller Mills, Madisonville, Tenn.	People's Roller Mills, Madisonville, Tenn.	Wynn	Guarantee...16.56 Found.....14.48	3.38 3.83	6.54 4.65	58.25 61.49	
42	Arab Horse Feed	M. C. Peters Mill Co., Omaha, Nebr.	Hermitage Feed Co., Nashville, Tenn.	White	Guarantee...9.00 Found.....9.58	2.00 2.66	15.00 12.26	59.00 57.77	
39	King Corn Horse Feed...	M. C. Peters Mill Co., Omaha, Nebr.	Morehead & Young, Nashville, Tenn.	White	Guarantee...9.00 Found.....11.88	1.50 2.86	18.00 13.82	50.00 52.92	
18	Banner Feed	Quaker Oats Co., Chicago, Ill.	Clark, Burkle & Co., Memphis, Tenn.	Stout	Guarantee...9.75 Found.....11.86	3.75 2.64	10.50 9.13	62.00 62.40	
68	American Hen Feed	Quaker Oats Co., Chicago, Ill.	McDaniel & Ault, Knoxville, Tenn.	Wynn	Guarantee...10.00 Found.....11.85	2.50 3.04	5.00 2.37	60.00 66.10	
19	Excelsior Feed	Quaker Oats Co., Chicago, Ill.	Harriman Grain & Corn Co., Harriman, Tenn.	Wynn	Guarantee...10.00 Found.....10.97	4.00 3.86	9.00 8.96	62.00 61.92	
6	Pure Corn Bran	Riverside Mills, Nashville, Tenn.	Riverside Mills, Nashville, Tenn.	White	Guarantee...9.53 Found.....9.13	8.21 4.48	9.28 8.03	62.99 65.75	
5	Mixed Chicken Feed	Riverside Mills, Nashville, Tenn.	Riverside Mills, Nashville, Tenn.	White	Guarantee...10.67 Found.....9.30	3.83 4.83	3.68 2.36	68.49 69.66	
2	Bran	Richland Mills, Cole, Tenn.	Richland Mills, Pulaski, Tenn.	White	Guarantee...15.00 Found.....14.39	2.87 4.19	12.29 7.56	51.25 59.05	
4	Rialto	Raines, Connell & McFadden, Memphis, Tenn.	Raines, Connell & McFadden, Memphis, Tenn.	Stout	Guarantee...12.34 Found.....14.30	3.74 5.46	9.50 11.50	57.80 50.03	

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36	Superior Laying Feed ...	Superior Feed Co., Memphis, Tenn.	American Grain Co., Memphis, Tenn.	White	Guarantee.. Found.	10.00 11.32	2.25 3.15	4.50 2.36	63.00 70.91
13	Superior Cow Feed	Superior Feed Co., Memphis, Tenn.	W. D. Moon & Co., Memphis, Tenn.	Stout	Guarantee.. Found.	8.00 12.03	1.50 2.72	18.00 12.17	50.00 51.28
34	Superior Stock Feed	Superior Feed Co., Memphis, Tenn.	American Grain Co., Memphis, Tenn.	White	Guarantee.. Found.	11.00 9.00	2.50 1.39	12.00 14.22	50.00 47.12
64	Pure Winter Wheat Bran.	Standard Tilton Milling Co., St. Louis, Mo.	Chattanooga Feed Co., Chattanooga, Tenn.	Wynn	Guarantee.. Found.	14.50 17.55	4.00 4.30	9.50 7.44	54.00 52.35
29	Pure Wheat Bran	Scott County Milling Co., Dexter, Mo.	Jones & Rodgers, Memphis, Tenn.	White	Guarantee.. Found.	14.50 15.18	4.00 3.90	9.50 9.38	52.25 55.50
35	Superior Cow Feed	Superior Feed Co., Memphis, Tenn.	American Grain Co., Memphis, Tenn.	White	Guarantee.. Found.	8.00 9.61	1.50 2.30	18.00 10.75	50.00 60.48
46	Wheat Bran and Wheat Shorts	Straw Plains Milling Co., Straw Plains, Tenn.	Straw Plains Milling Co., Straw Plains, Tenn.	Wynn	Guarantee.. Found.	14.50 15.36	4.00 3.92	7.00 8.56	55.00 53.75
8	Very Best Feed	Sykes Milling Co., Cleveland, Tenn.	J. H. Harle & Bros., Cleveland, Tenn.	Wynn	Guarantee.. Found.	14.50 14.48	4.30 4.37	6.50 6.70	55.00 57.30
66	Standard Cotton Seed Meal	Southern Cotton Oil Co., Atlanta, Ga.	McDaniel & Ault, Knoxville, Tenn.	Wynn	Guarantee.. Found.	38.62 38.17	6.00 8.15	10.00 6.40	22.00 31.68
99	Pure Wheat Shorts	Tennessee Mill Co., Estill Springs, Tenn.	W. W. Stovall, Winchester, Tenn.	White	Guarantee.. Found.	16.00 16.32	4.00 4.42	6.00 6.40	56.00 58.23
3	Pure Bran	Tennon Mills, Riversburg, Tenn.	B. F. McGrew, Pulaski, Tenn.	White	Guarantee.. Found.	15.09 14.92	2.87 4.31	12.29 7.58	51.25 57.87
88	Second Class Cotton Seed Meal	Tennessee Fibre Co., Memphis, Tenn.	Cornelius, Newbill & Co., Nashville, Tenn.	White	Guarantee.. Found.	20.00 25.71	5.00 4.53	22.00 20.75	38.00 34.71
91	Pure Wheat Shorts	Tennessee Mill Co., Estill Springs, Tenn.	W. W. Stovall, Winchester, Tenn.	White	Guarantee.. Found.	16.00 16.06	4.00 4.24	6.00 5.77	56.00 59.05
17	Prime Cotton Seed Meal.	Tennessee Cotton Oil Co., Memphis, Tenn.	Tennessee Cotton Oil Co., Memphis, Tenn.	Stout	Guarantee.. Found.	38.61 37.12	8.00 7.62	11.50 7.13	25.00 32.85

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13	Wheat and Corn Bran....	Universal Milling Co., Lebanon, Tenn.	Dodson Grain Co., Lebanon, Tenn.	White	Guarantee... Found	12.90 14.83	4.82 6.58	8.10 9.25	50.00 53.22
90	Mixed Wheat and Corn Bran Screenings	Valley Milling Co., Petersburg, Tenn.	Valley Milling Co., Petersburg, Tenn.	White	Guarantee... Found	14.10 15.18	5.61 3.75	5.61 5.98	54.10 59.76
3	Vonoir Daisy Feed	Vonore Mills, Vonore, Tenn.	Vonore Mills, Vonore, Tenn.	Wynn	Guarantee... Found	14.50 12.81	4.00 3.95	8.00 6.64	55.00 61.55
14	Virtue Mill Feed	Virtue Milling Co., Concord, Tenn.	Blackburn & Davis, Lenoir, Tenn.	Wynn	Guarantee... Found	16.19 15.80	4.61 2.66	7.42 5.15	54.00 61.33
25	Syrup Ration Horse Feed.	John Wade & Son, Memphis, Tenn.	Pease & Dwyer, Memphis, Tenn.	White	Guarantee... Found	10.50 9.14	3.50 2.60	12.00 11.08	55.00 60.50
27	Wade's Little Chick Feed.	John Wade & Son, Memphis, Tenn.	Pease & Dwyer, Memphis, Tenn.	White	Guarantee... Found	11.00 12.26	3.00 2.92	4.00 3.00	65.00 68.82
28	Wheat and Corn Bran ...	Yates, Donelson Co., Memphis, Tenn.	W. D. Moon & Co., Memphis, Tenn.	White	Guarantee... Found	13.25 14.39	3.70 4.78	10.00 7.65	37.15 59.36
19	Dairy Feed	John Wade & Son, Memphis, Tenn.	John Wade & Son, Memphis, Tenn.	Stout	Guarantee... Found	12.00 12.27	2.25 2.82	17.50 14.10	50.00 50.84
24	Alfalfa Mixed Feed	John Wade & Son, Memphis, Tenn.	John Wade & Son, Memphis, Tenn.	Stout	Guarantee... Found	10.50 11.67	3.50 3.61	12.00 13.66	52.80 53.60
28	Purity Feed	John Wade & Son, Memphis, Tenn.	John Wade & Son, Memphis, Tenn.	Stout	Guarantee... Found	10.00 10.97	5.00 4.86	5.50 4.08	65.00 64.36
5	Purity Feed	John Wade & Son, Memphis, Tenn.	W. D. Moon & Co., Memphis, Tenn.	Stout	Guarantee... Found	10.00 10.09	5.00 4.46	5.50 5.75	65.00 65.58
95	Wheat, Corn and Cotton Seed Products	Winchester Milling Co., Winchester, Tenn.	Winchester Milling Co., Winchester, Tenn.	White	Guarantee... Found	19.76 19.66	3.01 5.20	9.44 9.91	63.06 51.08
16	Bran or Mixed Feed	Watertown Milling Co., Watertown, Tenn.	T. C. R. R., Watertown, Tenn.	White	Guarantee... Found	15.09 15.80	4.16 4.65	8.00 8.24	55.85 55.19
10	Molasses Horse and Mule Feed	J. H. Wilkes & Co., Nashville, Tenn.	Whitsett & Bush, Nashville, Tenn.	White	Guarantee... Found	10.00 10.73	2.10 3.43	12.00 12.18	56.00 56.52

Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	SAMPLE DRAWN BY INSPECTOR	ANALYSIS	Protein Per Cent	Fat Per Cent	Fiber Per Cent	Carbohy- drates Per Cent
58	Feed Meal	Dan C. Wheeler & Co., Chattanooga, Tenn.	Dan C. Wheeler & Co., Chattanooga, Tenn.	Wynn	Guarantee.. 16.00 Found 8.95	1.96	1.84	1.96	73.07
10	Dixie Hen-Seed Feed	Webb & Maury, Memphis, Tenn.	Tucker Maulsby Co., Memphis, Tenn.	Stout	Guarantee.. 10.00 Found 10.88	3.50	4.00	3.50	60.00
23	Armego Stock Feed	Webb & Maury, Memphis, Tenn.	Webb & Maury, Memphis, Tenn.	Stout	Guarantee.. 12.00 Found 14.30	5.00	12.00	5.00	50.00
22	Riverside Dairy Feed ...	Webb & Maury, Memphis, Tenn.	Webb & Maury, Memphis, Tenn.	Stout	Guarantee.. 18.00 Found 15.36	4.00	14.00	4.00	45.00
29	Dixie Hen Feed	Webb & Maury, Memphis, Tenn.	Webb & Maury, Memphis, Tenn.	Stout	Guarantee.. 10.00 Found 10.97	3.50	4.00	3.50	60.00
26	Sampson Stock Feed	Webb & Maury, Memphis, Tenn.	Webb & Maury, Memphis, Tenn.	Stout	Guarantee.. 16.00 Found 14.74	4.00	12.00	4.00	40.00
						6.43	6.35	53.69	

TENNESSEE FEED CONTROL LAW.

CHAPTER 434.

HOUSE BILL NO. 495.

AN ACT to regulate the sale of concentrated commercial feeding stuffs; to define concentrated commercial feeding stuffs; to prohibit the adulteration of concentrated commercial feeding stuffs; to provide for the correct weighing and marketing, for making analyses and collecting samples of concentrated commercial feeding stuffs; to prescribe penalties for the violation of this Act; to vest the execution and enforcement of this Act in the Commissioner of Agriculture, and authorize him to prescribe rules and regulations therefor, and to repeal Chapter 465 of the Acts of the General Assembly of the State of Tennessee for the year 1907, being an Act entitled "An Act to regulate the sale of concentrated commercial feeding stuffs and the materials from which they are manufactured; to define concentrated commercial feeding stuffs; to prohibit the adulteration of commercial feeding stuffs; to provide for the correct weighing and marketing, for making analyses and collecting samples of commercial feeding stuffs; to prescribe penalties for the violation of this Act, and vesting the execution and enforcement of this Act in the Commissioner of Agriculture."

SECTION 1. *Be it enacted by the General Assembly of the State of Tennessee*, That every lot or parcel of concentrated commercial feeding stuff sold, offered, or exposed for sale within this State shall have affixed thereto, or printed thereon in a conspicuous place on the outside thereof, a legible and plainly printed statement, in the English language, clearly and truly certifying the weight of the package (provided that all concentrated commercial feeding stuffs shall be in standard weight bags or packages of 5, 10, 25, 50, 75, 100, 125, 150, 175 or 200 pounds); the name, brand or trade-mark under which the article is sold; the name and address of the manufacturer, jobber or importer; the names of each and all ingredients of which the article is composed; a statement of the maximum percentage it contains of crude fiber, and the percentage of crude fat, and the percentage of crude protein, and the percentage of carbohydrates, allowing 1 per cent of nitrogen to equal $6\frac{1}{4}$ per cent of protein; all four constituents to be determined by the methods in use at the time by the Association of Official Agricultural Chemists of the United States.

SEC. 2. *Be it further enacted*, That the term "Concentrated Com-

mercial Feeding Stuffs" shall be held to include all feeds used for live stock and poultry, except whole hays, straws and corn stover when the same are not mixed with other materials; nor shall it apply to the unmixed whole seeds or grains of cereals when not mixed with other materials.

SEC. 3. *Be it further enacted*, That each and every manufacturer, importer, jobber, agent, or seller, before selling, offering or exposing for sale in this State any concentrated commercial feeding stuffs, shall, for each and every feeding stuff bearing a distinguishing name or trademark, file for registration with the Commissioner of Agriculture a copy of the statement required in Section 1 of this Act, and accompany said statement, on request, by a sealed glass jar or bottle containing at least one pound of such feeding stuff to be sold, exposed or offered for sale, which sample shall correspond within reasonable limits to the feeding stuff which it represents in the percentage of crude protein, crude fat, crude fiber and carbohydrates which it contains.

SEC. 4. *Be it further enacted*, That whenever a manufacturer, importer or jobber of any concentrated commercial feeding stuffs shall have filed a statement, as required by Section 3 of this Act, no agent or seller of such manufacturer, importer or jobber shall be required to file such statement.

SEC. 5. *Be it further enacted*, That the Commissioner of Agriculture shall have the power to refuse the registration of any concentrated commercial feeding stuff under a name which would be misleading as to the materials of which it is composed, or when the names of each and all ingredients of which it is composed are not stated. Should any concentrated commercial feeding stuffs be registered and it is afterwards discovered that they are in violation of any of the provisions of this Act, the Commissioner of Agriculture shall have the power to cancel such registration.

SEC. 6. *Be it further enacted*, That each and every manufacturer, importer, jobber, agent or seller of any concentrated commercial feeding stuff, as defined in Section 2 of this Act, shall pay to the Commissioner of Agriculture an inspection tax of 20 cents per ton for each ton of such commercial feeding stuff sold, offered or exposed for sale or distributed in this State, and shall affix to or accompany each car shipped in bulk and to each bag, barrel or other package of such concentrated commercial feeding stuff a stamp, to be furnished by the Commissioner of Agriculture, stating that all charges specified in this section have been paid; provided, that the inspection fee herein pro-

vided shall not apply to unadulterated wheat, corn, rye and buckwheat bran; nor to unadulterated wheat, corn, rye and buckwheat middlings; nor to unadulterated wheat, corn, rye and buckwheat shorts; and provided, whenever any concentrated commercial feeding stuff, as defined in Section 2, is kept for sale in bulk, stored in bins or otherwise, the manufacturer, dealer, jobber or importer keeping the same for sale shall keep on hand cards of proper size upon which the statement or statements in Section 1 is or are plainly printed; and if the feeding stuff is sold at retail in bulk, or if it is put up in packages belonging to the purchaser, the manufacturer, dealer, jobber or importer shall furnish the purchaser with one of said cards upon which is or are printed the statement or statements described in this section, together with sufficient tax to cover same; provided, that the inspection tax of 20 cents per ton shall not apply to whole seeds and grains when not mixed with other whole seeds or materials. It is further provided that, upon demand, said inspection stamps shall be redeemed by the department issuing said stamps upon surrender of same, accompanied by an affidavit that the same have not been used; provided, that nothing in this Act shall be construed to restrict or prohibit the sale of concentrated commercial feeding stuff in bulk to each other by importers, manufacturers or manipulators who mix concentrated commercial feeding stuff for sale; but importers, manufacturers and manipulators shall attach to such feeding stuff a tag stating that it is to be used for mixing purposes only, and this tag shall give the number of pounds in bulk or package, the name of the manufacturer, the name of the stuff and its analysis, showing crude protein, crude fat, crude fiber and carbohydrates; and a duplicate of said tag shall be sent to the Commissioner of Agriculture, together with a request for inspection. The Commissioner of Agriculture is hereby empowered to prescribe the form of such tax stamps.

SEC. 7. *Be it further enacted*, That any manufacturer, importer, jobber, agent or dealer who shall sell, offer or expose for sale or distribution in this State any concentrated commercial feeding stuff as defined in Section 2 of this Act, without complying with the requirements of the preceding sections of this Act, or who shall sell or offer or expose for sale or distribution any concentrated commercial feeding stuffs which contain substantially a smaller percentage of crude protein, or crude fat, or carbohydrates, or a larger percentage of crude fiber than certified to be contained, or who shall mix or adulterate any concentrated commercial feeding tuff with foreign, mineral or other substance or substances, such as rice chaff or hulls, peanut

shells, ground or crushed corn cobs, oat hulls or similar materials of little or no feeding value, or with substances injurious to the health of domestic animals, or who shall sell, offer or expose for sale any concentrated commercial feeding stuffs so mixed or adulterated, shall be guilty of a violation of this Act, and the lot of feeding stuffs in question shall be seized and condemned, sold or destroyed by the Commissioner of Agriculture or his duly authorized representative, and the proceeds from said sales shall be converted into the State treasury for the use of the department executing the provisions of this Act. Such seizure and sale shall be made by the Commissioner of Agriculture, or under the direction of an officer of his appointment. The sale shall be made at the courthouse door in the county in which the seizure is made; provided, that whenever, for sufficient reasons appearing to the Commissioner of Agriculture or his representative aforesaid, another place of sale is more convenient and more desirable, such place of sale may be selected. The sale shall be advertised for thirty days in a newspaper published in the county in which the seizure is made, or, if no newspaper be published in such county, then it shall be advertised in a newspaper published in the nearest county thereto having a newspaper. The advertisement shall state the brand or name of the goods, the quantity, and why seized and offered for sale, and must show the time and place of sale. The Commissioner of Agriculture, however, may, in his discretion, release the feeding stuffs so withdrawn when the requirements of the provisions of this Act have been complied with, and upon the payment of all the costs or expenses incurred in any proceeding connected with such seizure and withdrawal.

SEC. 8. *Be it further enacted*, That it shall be unlawful and shall be punished as other violations of this Act to sell, offer or expose for sale any mixed or compounded commercial feeding stuff containing as an ingredient crushed or ground ear corn; provided, that nothing herein shall prevent the sale of crushed or ground ear corn by itself, and not mixed with any other substance, but the crushed or ground ear corn, when sold by itself, is a concentrated commercial feeding stuff defined in Section 2 of this Act, and the sale thereof within this State shall be governed by the provisions of this Act and the rules and regulations prescribed by the Commissioner of Agriculture.

SEC. 9. *Be it further enacted*, That if at any time the Commissioner of Agriculture, or his duly authorized representative, shall have reason to believe that any feeding stuff offered or exposed for sale in this State does not comply with the requirements of this Act as to the

ingredients or substances of the same, it shall be his duty, by written order, to suspend the sale of the same until he shall have satisfied himself, or shall be satisfied by an analysis or otherwise, that such feeding stuff is made up or compounded as required by this Act. If he shall find that the same does not comply with this Act, then he is authorized to proceed with regard to the same as provided in Section 7 of this Act.

SEC. 10. *Be it further enacted*, That the Commissioner of Agriculture, together with his deputies, agents and assistants, shall have free access to all places of business, mills, buildings, vehicles, cars, vessels and packages, of whatsoever kind, used in the manufacture, importation or sale of any concentrated commercial feeding stuff, and shall have power and authority to open any package containing or supposed to contain any concentrated commercial feeding stuff; and upon tender and full payment of the selling price of said samples, take therefrom, in the manner hereinafter prescribed, samples for analysis; and he shall annually cause to be analyzed at least one sample so taken of every concentrated commercial feeding stuff that is found, sold or offered or exposed for sale in this State under the provisions of this Act. Said samples, not less than one pound in weight, shall be taken from not less than ten bags or packages, or, if there be less than ten bags or packages, then the samples shall be taken from each bag or package, if it be in bag or package form; or, if such feeding stuff be in bulk, then it shall be taken from ten different places of the lot. The Commissioner of Agriculture is hereby authorized to publish from time to time, in reports or in bulletins, the results of the analysis of such sample or samples, together with such additional information as circumstances advise; provided, however, that if such sample or samples as analyzed by the Commissioner of Agriculture differs from the statement prescribed in Section 1 of this Act, then, at least thirty days before publishing the results of such analysis, the Commissioner of Agriculture shall give written notice of such results to the manufacturer, importer, agent or jobber of such stock, if the name and address of such manufacturer, jobber or importer be known; provided, further, that if the analysis of any such sample does not differ substantially from the statement prescribed in Section 1 of this Act appearing upon the goods, the manufacturer shall be considered as having complied with the requirements of this Act.

SEC. 11. *Be it further enacted*, That the Commissioner of Agriculture shall from time to time prescribe and publish rules and regulations for carrying out the provisions of this Act.

SEC. 12. *Be it further enacted*, That the Commissioner of Agriculture is authorized to prescribe rules and regulations governing the grading of any and all concentrated commercial feeding stuffs defined in Section 2 of this Act.

SEC. 13. *Be it further enacted*, That any manufacturer, importer, jobber, agent or dealer who shall sell, offer or expose for sale or distribute in this State any concentrated commercial feeding stuffs without having attached thereto or furnished therewith such tax stamps as required by the provisions of this Act, or who shall use the required tax stamps a second time to avoid the payment of the tonnage tax, or any manufacturer, importer, jobber, agent or dealer who shall counterfeit or use a counterfeit of such tax stamps shall be guilty of a violation of the provisions of this Act.

SEC. 14. *Be it further enacted*, That any manufacturer, importer, jobber, agent or dealer who refuses to comply with the requirements of the provisions of this Act, or any manufacturer, importer, jobber, agent or dealer or person who shall impede, obstruct, hinder or otherwise prevent or attempt to prevent any chemist, inspector or other authorized agent in the performance of his duty in connection with the provisions of this Act, shall be guilty of a violation of the provisions of this Act.

SEC. 15. *Be it further enacted*, That any manufacturer, importer, jobber, agent or dealer who shall violate any of the provisions of this Act, or the regulations adopted by the Commissioner of Agriculture, upon conviction thereof, shall be fined not exceeding fifty dollars for the first offense, nor more than two hundred dollars for each subsequent offense, and the proceeds from such fines shall be covered into the State treasury for the use of the department executing the provisions of this Act.

SEC. 16. *Be it further enacted*, That whenever the Commissioner of Agriculture, or his duly authorized representative, becomes cognizant of any violation of the provisions of this Act, he shall immediately notify, in writing, the manufacturer, importer, jobber or dealer, if same be known, and after thirty days he shall notify the District Attorney General, who shall cause proceedings to be commenced against the person or persons so violating the Act, and the same prosecuted in the manner required by law.

SEC. 17. *Be it further enacted*, That in all prosecutions in the courts of this State arising under this Act, and the rules and regulations made in accordance therewith, the certificate of the analyst or

other officer making the analysis or examination, when duly sworn to and subscribed by such analyst or officer, shall be *prima facie* evidence of the facts therein certified.

SEC. 18. *Be it further enacted*, That there is hereby appropriated, for the purpose of enforcing the provisions of this Act, a sum not exceeding the amount of fees and fines collected, and moneys or proceeds derived from the seizure and sale of feeding stuffs under its provisions. Such expense shall be paid by warrant of the State Comptroller, upon bills filed by the Commissioner of Agriculture. All fees collected under the provisions of this Act shall be paid into the State treasury.

SEC. 19. *Be it further enacted*, That the Commissioner of Agriculture shall appoint such analysts, chemists and inspectors as may be required to carry out the provisions of this Act, and any part of the labor of the analysts and chemists, upon request of the Commissioner of Agriculture, shall be performed by the Tennessee Experiment Station, with such compensation therefor as may be approved by the said Commissioner of Agriculture.

SEC. 20. *Be it further enacted*, That all laws and parts of laws in conflict with this Act, including Chapter 465 of the Acts of 1907, the title of which is recited in the caption of this Act, be and the same are hereby repealed.

SEC. 21. *Be it further enacted*, That this Act take effect from and after the first day of June, 1909, the public welfare requiring it.

Passed April 29, 1909.

M. HILLSMAN TAYLOR,

Speaker of the House of Representatives.

WM. KINNEY,

Speaker of the Senate.

Approved May 1, 1909.

MALCOLM R. PATTERSON, *Governor.*

The spraying of potato fields for the control of disease has kept up at the Vermont station for twenty years. The average gain in yield by the use of bordeaux mixture has been 105 bushels per acre, or sixty-four per cent in the year 1910, when there seemed to be no disease, the gain was eighteen per cent in 1911, when it was very prevalent, the gain was 215 per cent. And yet thousands have never used a single drop of the spray on their potatoes. Have they not learned these facts?—*Farm and Fireside.*

PURE SEED.

BY A. L. GARRISON, CHIEF FEED AND SEED INSPECTOR, DEPARTMENT
AGRICULTURE.

"A man of words and not of deeds, is like a garden full of weeds."

The question of pure seed is a very important one in weed control; not only in weed control, but it is also a question that has more to do with production than any other single question relating to the various crops of Tennessee. I think a more opportune time could not be had than now to sound a note of warning to the farmers of the State who purchase their field seed on the general market to look well to the selection. A great many complaints were sent to this office last season, all of which could have been properly controlled if the farmer had availed himself of the protection which is guaranteed under our present seed law. I would like to place a copy of the seed law in every farmer's hand in the State, and in doing so assure him that this Department is willing and anxious to aid him in every way possible in driving from the market low-grade seed. A copy will be sent free on application.

Insist that the law be complied with when you buy. It is strange but true that the average farmer, while he recognizes the necessity of good breeding in his stock, is slow to recognize the same principle in regard to his seed. There was a time when any old cow was allowed in the dairy herd. Now no animal whose milk falls below a certain test as to quality or average amount is allowed to remain in the herd. This same business principle should be applied to every ounce of seed that is put into the ground. No seed should be planted that has not been thoroughly cleaned and rendered free from all disease germs or impurities, and which has not been tested as to germinating power.

A serious drawback to the selection of good seed is the common practice of waiting until about time for sowing before buying. It is then too late to ascertain its origin and history or to test its vitality, even if the planter has the desire to do so. If the cultivator would secure the best possible results from his labor, the seed should be bought by sample in the fall or winter before planting. First of all, it should be examined for purity and then a simple home germinating test should be conducted. If the sample is pure and of good germinating capacity the purchase may be completed, after which a careful sorting should be made preparatory to planting in the spring.

IMPORTANCE OF SEED SELECTION.

BY A. L. GARRISON, CHIEF FEED AND SEED INSPECTOR.

During the tour of the Agricultural Special Train over the State, I made the statement to thousands of farmers that there was no time devoted to the crop that paid better than seed selection, and that there is just as much development in field seed as there is in live stock. I am well aware of the fact that a great many did not credit this statement with its true significance, so I am going to follow up my line of argument with corroborative evidence. I will first most respectfully call your attention to Bulletin No. 57 of the Virginia Department of Agriculture, which has an article, "Improve Your Seed Corn."

The farmer should give as much care and attention to the improvement of his seed corn as he does to the improvement of his live stock. It will pay him just as much. No farmer wants to breed from live stock that has a large mixture of scrub blood. Neither should he plant seed corn that has a large mixture of pollen from nubbins and barren stalks, for this kind of corn will produce nubbins and barren stalks just as certainly as scrub blood will show from breeding stock with scrub blood in them.

Then why not plant a seed corn plot off to itself and breed up your seed corn year after year? In a few years you will increase the yield of your corn crop ten bushels or more per acre without any extra cost.

The simplest kind of a seed corn plot is one handled in the following manner: In the first place select the best ears that you can find with which to plant it; select ears of the type that will yield the most in the average season; ears of medium length with a deep kernel, with straight, even rows, and which are well filled at butt and tip. Then test these ears to see if they will germinate well. Then plant a plot from these ears just as though you were planting an ordinary field, and throughout the year give it good ordinary cultivation. If there is possibility that you may not give a plot like this good care, it had better be located on one side of the big field than by itself. The time to give especial attention to this sort of a plot is in the fall, at seed corn picking time. By all means this crop must be harvested and the corn dried and stored in the best manner possible.

This sort of a seed corn plot is not truly a breeding plot. It is just simply a plot of ground planted from the best ears, given good cultivation, and to which special attention is given at harvest time. The advantage of this sort of seed plot to most farmers simply is that when they have a particular plot that they call their seed corn plot, they are more likely to give special attention at harvest time to pick-

ing their seed at the right time and properly caring for it than when all the corn is in a big field together. The benefit is more from proper harvesting than from any true breeding. In this sort of a plot the character of the stalks may also be taken into consideration in picking seed.

A breeding plot takes but little more time and trouble than the ordinary plot, and in a few years produces much better results. In its simplicity it is as follows: A number of the best ears are collected as above. The ears are numbered, and each ear is planted in a row to itself. This, of course, takes extra time and trouble at planting time, but is time for which, in the end, good pay is sure to be received. Men who try this ear-to-a-row planting for the first time are always astonished. One row, for instance, that was planted from what appeared to be the best ear, may not do well at all. The plants may be noticeably shorter than those of the surrounding rows and yield less at harvest time. Another row may tassel out three or four days before any of the other rows and produce an earlier maturing crop. A man who will observe this ear-to-row corn breeding plot will learn much and receive good pay for time so spent. Ordinary care is given until tasseling time; then, just as the tassels are coming out, go over every other row of the entire plot and pull out all the tassels. It may be necessary to go over the entire plot several times in order to get all the tassels of every other row. In the fall seed corn will be selected only from the rows which were detasseled. This is important, for it has been proved beyond all doubt that inbred corn—that is, corn whose ears have been pollinated by pollen from the same plant or from brother plants—will not produce nearly as much as cross-bred corn.

When harvest time comes the product of these detasseled ears is weighed separately, and it is determined which ear yielded best and produced the most sound corn of a good type. Of course, it is from such rows that the seed for future seed corn breeding plots will be selected. The seed corn for planting the entire crop of the next year may be selected from any of the rows in the plot, but preferably, of course, from the high-yielding ones. This method means that care must be taken at planting, tasseling and at the harvest time.

Breeding of this sort must be kept up for several years before the results are felt to any great extent in the field; but improvement is bound to come, and may result in the increase in yield of all corn on the farm of as much as ten to fifteen bushels to the acre. Such increases which are due to breeding alone are net profit.

WEEDS AND HOW TO ERADICATE THEM.

BY A. L. GARRISON, CHIEF FEED AND SEED INSPECTOR.

"Cursed is the ground for thy sake; in sorrow shalt thou eat of it all the days of thy life; thorns also and thistles shall it bring forth to thee; and thou shalt eat the herb of the field." So reads the doom that was hurled down the centuries from the gates of Eden when man was ejected from a paradise lost to earn his bread by the sweat of his brow. From that day to the present weeds have followed in the footprints of man. He no sooner pitches his tent or builds his more permanent home than they entrench themselves around it. He no sooner commences to till the soil than they commence to dispute its possession with the plants that he sows, and thus they harass and perplex him and complicate all his best devised methods for subduing the earth.

It is true at the same time that in lands that have never been tilled we find some weeds, but they are native to the soil, and the number of the species is not only limited, but those which do exist seem unable to multiply to any great extent in the natural surroundings amid which they grow. On the other hand, in lands that have long been cultivated we frequently find that foreign varieties of weeds are far more numerous and aggressive than the native species. Regions that have been settled with inhabitants drawn from different countries are peculiarly liable to be infested with the weeds of the different countries from which these inhabitants have come. The seeds of the weeds are imported along with the grain that is brought for sowing, and are introduced in various other ways. Some of the varieties thus imported do not take kindly to the new conditions, but other sorts, like the people who have brought them, oftentimes find their new surroundings preeminently favorable to a greatly increased development.

The greatest interest the farmer has is not how he got them, but the methods and principles generally applicable in their destruction.

In the conflict with weeds there are certain general methods and principles which are applicable in a greater or less degree for the destruction of all weeds; and there are also certain specific modes of treatment which apply only to the eradication of particular sorts of weeds. We shall consider the general methods and principles applicable in weed destruction.

The general methods and principles applicable in weed destruc-

tion which, in the writer's opinion, are of the most consequence, may be described as follows:

1. The persistent and careful study of the habits of growth of all the various sorts of weeds with which one's farm is infested, so as to be able to deal with them in the most rational way possible.

2. The modification (when necessary) of the scheme of rotation that has been adopted, so that such crops as allow the seeds of the weeds which infest them to ripen may, for a time, be omitted from the rotation.

3. When certain methods of eradication have been fixed upon, the careful and wise adaptation of these methods to such conditions of soil and climate as are found in the locality concerned.

4. The exercise of due care, when seeds are purchased, to see that they are perfectly pure—that is, perfectly free from the seeds of weeds—and also the exercise of due care with respect to such seeds as are grown at home to see that they, too, are perfectly free from weed seeds.

5. The exercise of due care to see that the threshing machine, especially when it comes directly from a farm infested with any form of noxious weed, is thoroughly cleaned before it is used.

6. The exercise of due care to see that the chaff from the fanning mill, when it is suspected of containing any weed seeds, is burnt or otherwise thoroughly destroyed, and that all screenings are also carefully looked after.

7. The growing to the largest extent that is practicable of cultivated crops upon the farm infested.

8. The growing of clover and alfalfa, so far as this can be done with profit.

9. The growing of soiling crops to the extent that they may be found practicable, both because of the fact that they can be cut almost at any time that is desirable and also because of their "smothering" properties.

10. The utilizing of sheep for the destruction of weeds in pastures.

11. The growing at home, so far as possible, of the food required by the live stock of the farm, instead of purchasing it elsewhere.

12. The keeping of the land of the farm constantly at work, so far as this can possibly be effected.

13. The stimulation of the soil to a constantly vigorous production by means of thorough working and a large use of manure.

14. The practice of autumn cultivation to the largest extent that is possible.

15. The exercise of the utmost possible precaution that no weed seeds ripen upon the farm, if by any means their ripening can be prevented.

16. The sowing of two or three crops in succession the same season and grazing them down with sheep.

17. The giving of due heed to all the agencies by which weeds are distributed and propagated, so as always to be able to counteract or defeat those agencies.

18. When once the work of eradication has been undertaken, the making of it as thorough as possible, and the accomplishment of it in the shortest possible time.

19. When once a state of cleanliness has been secured, the maintenance of it thereafter as perfectly as possible under all circumstances.

I would like to discuss more in detail all of the above methods, but space will not permit, and I will have to content myself with calling your attention briefly to No. 13.

STIMULATE THE LAND TO PRODUCE PLENTIFULLY.

Weeds can be much more easily dealt with when the land is kept constantly stimulated to vigorous productivity than when the soil is left to run down and become infertile for lack of proper manuring. When crops are strong, weeds do but little harm in them compared with the injury they work when they are allowed to grow amid crops that are thin and poor. When the soil sustains a vigorous growth, the useful crops leave many forms of weeds behind in the race, especially in the early part of the season. Where the growth is vigorous in the early stages of the crop, the weeds have much less opportunity of monopolizing the growing area. Growing good crops is synonymous with good farming—that is, the raising of good crops is in itself a great hindrance to the multiplication of weeds. This agrees with the well-known fact that the spread of weeds is usually much more rapid and complete on impoverished farms than elsewhere; hence those who desire clean farms will have done much to secure the desired end when they adopt such measures as will also maintain them in a high state of fertility. Much may be done in the way of securing this fertility by growing catch crops for feeding off or plowing under after the earlier crops of the season have been removed. In all localities where the climate is not too severe, peas, buckwheat and rape

may all be grown as catch crops. The cultivation requisite for preparing the ground for these crops is also good for the destruction of weeds. It may happen sometimes that the season will be so dry that the seeds sown for catch crops will not germinate; when such is the case, the dry weather which produces this result will also be hurtful to the growth of weeds.

There are a great many publications on this vitally important subject which should be read by the farmers of the country. Prof. Shaw's small book, published by the Webb Publishing Company, of Minneapolis, Minn., is very interesting.

ROOTS REACH GREAT DEPTH.

Much misapprehension exists regarding the depths to which roots penetrate the soil. It is a general belief that the roots of cultivated crops do not reach to a greater depth than one or two feet.

Corn roots have been found to penetrate four feet deep and to fully occupy the soil to that depth. On drier and deeper soils they went as deep as eight feet. Roots of small grains, such as wheat, oats and barley penetrated the soil from four to eight feet and even ten feet in depth.

Perennial grasses have been found to go to a depth of four feet the first year and five and one-half feet the next year and they probably go considerably deeper during succeeding years. Other crops have gone to the following depths: Potatoes, three feet; sugar beets, four feet; alfalfa, thirty to fifty feet. The buffalo berry penetrated the soil to the depth of fifty feet in Nebraska. In California grapevines went down to twenty-two feet; figwort, more than ten feet, goose foot, eleven feet, and hops plant, eight to ten feet.

Most of the above results were obtained in humid or sub-humid regions. Soils and climate differ in such a way to favor a somewhat deeper root penetration in arid regions, hence it is natural to expect to find roots at even greater depths than the above.

The conditions which encourage deeper rooting are drainage, limited supply of moisture and a soil porous and fertile to a great depth. Deep early cultivation also forces roots to seek the lower depths. Deep rooted plants are much more drouth resistant, due to the fact that they can draw on the lower water supply during periods of drouth. They also have a larger feeding area and the fertility of the soil is not depleted so quickly.—*D. W. Frear, Colorado Agricultural College.*

**DEPARTMENT OF AGRICULTURE,
STATE OF TENNESSEE.**

Official Order No. 16.

Rules and Regulations Promulgated by the Commissioner of Agriculture and the State Live Stock Inspector. Under Authority Conferred by the Acts of Tennessee, 1901, 1907 and 1909.

EFFECTIVE ON AND AFTER FEBRUARY 10, 1913.

The fact has been determined by the Commissioner of Agriculture and State Live Stock Inspector, and notice is hereby given, that the transportation and movement of cattle from the quarantined area of this State or from the quarantined area of any other State into the "tick free" area of Tennessee is hazardous and is liable to cause re-infection of territory which has been freed of ticks and released from quarantine unless such movement be done under certain well-defined restrictions. Now, therefore, we, T. F. Peck, Commissioner of Agriculture, and G. R. White, State Live Stock Inspector, do hereby order:

SECTION I. That the Rules and Regulations governing Live Stock Sanitary Control Work in Tennessee, promulgated April 3, 1912, and effective April 5, 1912, be and the same are hereby amended so as to make Section 9 thereof read as follows:

"It is hereby ordered that no person, firm or corporation shall receive for transportation for 'immediate slaughter' into the State of Tennessee any cattle from the quarantined area of this State or any other State quarantined on account of the existence of Southern or Texas fever, except in accordance with the following rules:

"(a) Cattle can only be transported to Chattanooga, Nashville and Memphis, Tennessee.

"(b) Cattle shall be free of ticks (*Margaropus annulatus*), shall have been dipped at point of origin in a standard arsenical solution within twenty-four hours of time of loading, under the supervision of a live stock inspector commissioned as such by the State Veterinarian or State Live Stock Sanitary Board of the State from which shipment originates, and an official permit issued by him shall be made in duplicate, the original copy to be attached to the waybill, and the duplicate copy immediately mailed to Dr. G. R. White, State Live Stock Inspector, Nashville, Tennessee.

"(c) Cattle shall only be transported by rail or boat, and the cars in which said cattle are transported shall bear placards on each side stating that said cars contain Southern cattle, and the waybills and other papers regarding the shipment shall be so marked.

"(d) On arrival at destination, or when unloaded to be fed or watered, or for other purposes, such cattle shall be placed in pens plainly marked 'Quarantined Pens' and used only for Southern cattle. There shall be a space not less than ten feet wide between such quarantine pens and pens used for cattle from the non-quarantined area, which space shall not be occupied by cattle, and shall have on each side a tight board fence not less than six feet high.

"(e) No car or boat containing a shipment of cattle of the quarantined area shall receive on board cattle which are not of the quarantined area; neither shall shipments of cattle of the quarantined area be made to points in the non-quarantined portion of this State where proper facilities have not been provided for transferring the said cattle from the cars or landing in the stock yards or slaughter houses without passing them over public highways.

"(f) The cars and boats used to transport such cattle, and also the chutes, alleyways and pens not reserved for the exclusive use of such cattle, shall be cleaned and disinfected in the following manner: As soon as possible after unloading, and before they are again used to store or shelter animals or merchandise, remove all litter and manure. This litter and manure may be burned or may be disinfected by mixing it with lime or saturating it with a five per cent solution of one hundred per cent carbolic acid; wash the interior surface of the cars and the watering and feeding troughs with water until clean; saturate the entire interior surface of the cars, including the inner surface of the car doors, and the feeding troughs, chutes and floors of the pens, with a mixture made with one and one-half pounds of lime and one-fourth pound of one hundred per cent carbolic acid to each gallon of water, or with a solution made by dissolving four ounces of chloride of lime to each gallon of water."

Given under our hands and seal, at State Capitol, Nashville, Tennessee, this February 1, 1913.

(SEAL)

T. F. PECK,

Commissioner of Agriculture.

G. R. WHITE,

State Live Stock Inspector.

THE DECORATION OF THE HOME.

ADDRESS OF MRS. JAMES C. BRADFORD BEFORE THE HOME-MAKERS' ASSOCIATION.

In speaking of the decoration of the home it is well to consider the influence of environment upon the formation of taste and character, and the importance of surrounding the child with things of beauty and refinement. The home is the center of the life of the family. From the home emanates all the influences that go to build up the character of the family. As the child's home is, so is the child, the boy, the man, the citizen. The home should shape and form his moral, physical and mental character.

The very foundation of the State is the home, and the farm home is the home upon which the very life of the people depends. Hence the great cry, "Back to the farm." We expect the farm home to solve many of the perplexing economic and industrial questions of the day, upon which the judicious reduction of the cost of living so much depends. The farmer's home must be an anchor to keep the farmer on the farm, so that the farm may be an inheritance, a precious legacy to the children of the farmer, who will feel that the great agricultural interests of the country are their own, so that some of the great wealth of the country may remain in the farmer's hands.

The ultimate need is better rural life in the development of community effort and social resources. There is no education without a good school, and no social intercourse without good roads. The farmer's home should be the most important factor in the rural life of the community, contributing to the social, moral, educational and religious *life* of the community. In this day and generation the school goes hand in hand with the home. In our development they have a most reciprocal influence. But the home must set the standards. So great is the reciprocal influence of home and school that some one has said: "The home may well be made the center of rural school teaching. The school is capable of changing the whole attitude of the home life, and the part that women should play in the development of the best country living."

To attain a more thorough knowledge of better methods of living in the farmer's home, it is necessary to have a better community life in the country, which is accomplished by greater facilities for bringing people together. We need better roads, better educational advantages; clubs for the study of all that pertains to the betterment of the home and school should be formed. Then we will know that which will

make the home and the school more beautiful and more attractive, so that children may love the home, and they may love the school.

In considering the beauty of the home, the location, the construction, and its relation to the outside, environments must not be overlooked.

The interior decoration and the construction of the house must conform to all the requirements of the decorator—for good interior decoration has its beginning in good architecture. A room which has good lines, good proportion, requires less decoration, and looks much better than one not so constructed.

Proportion is "good breeding in architecture." There are a few fundamental principles of artistic decoration which one must consider. Proportion of room, its location, and its color harmony. In the room to be decorated there must first be good lines. If the room is too high the effect of lowering the ceiling may be attained by allowing the ceiling paper to be dropped to meet the wall paper, and put a picture moulding where the ceiling paper and the wall paper meet. A low ceiling may be made to look higher by using a striped paper from baseboard to ceiling, but one must avoid big stripes, as stripes must be unobtrusive and of same color-tone as background of paper.

Limiting door space adds to the wall space. After line and proportion comes color scheme. The color treatment of a room depends upon the quantity and the quality of the light in the room and its location. Harmony and appropriateness are to be carefully watched in the selection of colors. Harmony in color is the selection of colors somewhat in the same tone, or of contrasting colors of the same depth of tone. Contrasting colors emphasize each other. Red, green, and blue are the primary colors. A knowledge of complementary colors is important. Colors when combined should make a harmonious tone, altogether harmonious and pleasing to the eye. These colors form the strongest contrast. There are cool colors, such as blues in various grades, grays and apple greens; the warm colors are the reds, golden browns, pure gold, olive green.

Colors are also classified as grave, gay, or sober. In the selection of color schemes for a room, one must first consider the harmonious whole, which depends upon the background. In a room in which the walls are colored bright red, and the floor covered with a bright green rug, the contrast between the two will make both stand out and will be offensive to the eye. If the background of floor and the walls is so striking, it is difficult to have furnishings blend with the color. Better to have one prevailing color as the predominant tone, or rather, two

contrasting ones. The background depends upon the floor color, the wall color and the hangings. In selecting these colors we must be guided by what is called gradation of color. The strongest color should begin at the base, which is the floor. The walls should represent the next lighter color, and the ceilings the last and third lightest color in the gradation. Therefore, the floor, wall and ceiling should have a certain relation to each other, as they are the setting or background of the furnishing, which includes furniture, curtains and other accessories in the decorations. Hangings and furniture cover should blend into the walls and the floor.

In summing up the principles and rules of good taste in furnishings and decoration there are a few simple rules that should guide one. Simplicity of treatment, floor covering, the size of the room, height of ceiling, and location of the room, and all that pertains to cleanliness and sanitary conditions. Simplicity is the first law of good taste. The Japanese understood this to a very great degree. Their bric-a-brac and dust-catching articles were kept in cupboards.

In decorating begin with the fixed stationary parts, floor, walls, ceiling. Furniture, draperies, pictures, bric-a-brac are used to complete the picture. To secure good results attend first to the floor. It is the foundation color. Carpet, if used, should conform to the conditions of the room. The size of the room will determine the size of the figure in the carpet. Have your design restful to the eye. Bare floors with rugs are much more sanitary and pleasing. Furniture should conform to the room and its uses. The choice of furniture is determined by the use to which the room is to be put. The cost of an article of furniture is not the measure of its value. Pictures not alone adorn the home, but should be selected for the development of the taste and character of the family. Good photographs and good prints help to educate the taste of the child. Framing and hanging of pictures are essential. Pictures are more desirable than bric-a-brac. Put bric-a-brac, if it is good, in a cabinet.

Plants and flowers add much to the beauty and grace and harmony of the decoration. Window boxes add much to the beauty and pleasure of the home.

Appropriateness and the eternal fitness of things should always be considered in the decoration. One beautiful picture, comfortable chairs, a table that will hold something, will add to the simplicity and comfort of the house. Above all things study comfort and the restfulness of the home, for it is the place where the good man, after the day's labor is over, goes for rest and comfort.

PURE FOODS.

ADDRESS DELIVERED BY LUCIUS P. BROWN AT THE MIDDLE TENNESSEE FARMERS' ASSOCIATION AT NASHVILLE, DECEMBER, 1912.

I have been asked to talk to the farmers on Pure Foods, and I think that the best thing I can do is to do as I did last year, which is to try and point out how the farmers can improve the food which they produce, and with an incidental word as to how they can guard against material which they have to purchase.

In the first place, very often farmers' grains are mixed with other material. Wheat may contain a certain amount of cockle, and more frequently may be mixed with rye and occasionally with oats. It is difficult to separate both of these, and the farmer gets docked more than he should by the miller, because the miller cannot afford to take any chances on it. An important matter in this connection is corn. In a wet season corn may not cure properly in the shock or in the crib, and so the meal made from it is damp, musty and unfit for human consumption. This is a proposition, on account of the dangerous character of such material, which the farmers should watch carefully, and on which, necessarily, the Pure Food and Drugs Inspection must take a decided stand.

I spoke last year on the subject of eggs. I want to repeat what I said then regarding case count eggs. The farmer loses on case count eggs because the dealer must play for safety. If the farmer would be careful in the gathering of eggs, would turn in none which are old or dirty, he would get a better price for his material, and would make more money. The method of selling eggs through candling, that is to say, paying only for the eggs which are good, the farmer standing the loss, is the only fair way to sell, and this is particularly the case if the farmers get to using parcels post, for then they will meet directly with the consumer and will meet with the kicks on quality, which, under present conditions, the grocer has to handle.

The weights of material are also very important, and I want to mention again the matter of shortage in butter, which we have had so much trouble about. I know myself how hard it is to make butter come up to weight, and when we have 75 per cent or more of the printed pats on the market short, it is time to talk about it. A large portion of the butter molds on the market are short, and hardly any cartons come up to proper size.

(The remainder of Dr. Brown's talk was with stereopticon slides, illustrating how to produce good milk, meats, etc., and for that reason cannot be given here.)

CORN CLUB WORK IN MIDDLE TENNESSEE.

(Columbia Herald.)

There is hardly anything in Middle Tennessee that has been conducted on so small a scale that is growing in interest and receiving the attention that the farm demonstration work is now getting from the farmers of this section. And to J. M. Dean, of the Bureau of Plant Industry at Washington, who has charge of the work in this section of the State, much of this increased work must be credited. A man unassuming, yet pleasing in his address and thoroughly interested in and in love with the work, he has gone about the work with a determination that has brought results, and when results are shown the people generally sit up and take notice.

The report of the work in this district, which Mr. Dean has recently made out for the Department of Agriculture at Washington, shows some most satisfactory and appealing figures.

There were seventeen counties organized in the boys' corn club work within his district, and within these counties there was an enrollment of 603 boys, with a final report in the fall of 1912 from 147 of these boys, with a total of fourteen counties reporting. The prize money earned by these boys aggregated \$1,583.75, with a total yield of 10,398 bushels in the corn club contests. The average yield from all the reports was 58 bushels, while the average of the best yield from each of the fourteen counties reporting was 103 bushels.

The number of demonstration farms in corn within this district, 52; acreage cultivated, 165; yield on the same, 9,570 bushels. The same acreage by the old methods, 5,412 bushels. Increase by demonstration methods, 4,158 bushels. Figuring this increase at the market price of 60 cents per bushel, the result is \$2,494.80 in favor of the demonstration work.

In cotton there were only fifteen demonstration farms, with a total of 30 acres. The difference in the demonstration work and the old methods on this acreage shows a gain of 12,828 pounds, or almost double the amount of the yield by the old methods. This seed cotton at 4 1-2 cents per pound nets the neat advantage of \$577.26, or a total difference of \$3,072.06 in favor of the demonstration work in this district for the year 1912.

Mr. Dean has started the work on a larger basis, and more interest than ever in the territory. Many farmers from various sections are asking for information and demonstration work where they laughed at the idea only a short time ago, and several counties have appropriated money to pay part of the salary of a local agent, the United

States Government supplementing this appropriation, and one county has made appropriation by a direct tax levy for the maintenance of the farm demonstration work in connection with the county high school.

Where these appropriations have been provided there will be a local agent appointed, who will be under the supervision of Mr. Dean and the Bureau of Plant Industry.

RUTHERFORD COUNTY COTTON CROP.

The cotton season of 1912 has practically closed in this county, and all of the product has been ginned and either sold or is being held by buyers and ginnerers. J. T. Rather & Co. report the crop at 6,200 bales, as against 10,500 bales for the year 1911, a falling off of 4,300 bales. This same company states that the quality of the cotton was about the same for both years, but that the average price realized this season was 12 1-2 cents per pound and about 11 cents per pound last season. The crop of 1912 brought the farmers of the county \$240,800 less than did the 1911 crop, although the price of the last crop was about 1 1-2 cents higher. The bulk of the crop is being held by the ginnerers and buyers, not more than one-fourth of it having been shipped from the county.—*Murfreesboro News-Banner*.

THE SILO SAVES ALL THE VALUE OF THE CORN PLANT.

All of the corn plant stored as silage is utilized. About 38 per cent of the food value of the corn is in the stalk and leaves. Without the silo most of this is wasted. Considering the succulency of silage, the increased digestibility of silage, some authorities claim that the corn-stalks in the silo equal the corn ears in the crib in food value.

THE "SKUNK."

The skunk is a "chicken thief," which renders important service by destroying immense numbers of mice, white grubs, grass hoppers, cricket, cutworms, hornets, wasps and other noxious forms. Although it prefers this kind of food, like the o'possum it will eat almost any animal matter and also at times certain wild fruits and berries. It is said to be fond also of eggs and young chickens; but the writer has known a mother skunk to make her nest and rear her young in the inner walls of a chicken yard and neither egg nor fowl was molested.—*Biological Survey*.

ORGANIZE CORN CLUBS NOW.

(Jackson Sun.)

This is the time of year for farmers, fruit growers and truckers to "get busy," preparing for the coming planting season. Fields are to be cleared for plowing and various other preparations made that will facilitate work when spring opens, and every minute and hour of every day that is favorable for plowing and planting is needed for that purpose, and much precious time can be saved if the farmer takes time by the forelock and gets his land ready to work before the time comes for working it.

Last fall the corn club boys came gamely to the front in several counties, taking many premiums and prizes at fairs, and why cannot our Madison County boys get a move on them and take some at home and abroad next fall?

They have plenty of time ahead of them now, and no section of the state offers a better opportunity for success than Madison County.

In Sumner County boys' corn clubs are now being organized. A number have already been formed, and active preparations are in progress for the coming season.

In 1912 Horace Key was the champion corn club boy of Sumner. He raised 104 bushels on an acre, and sold it at a net profit of \$45.

On the land immediately contiguous to that worked by young Key only sixty bushels were made to the acre, proving very conclusively that scientific methods pay.

Madison County boys have a great advantage in being in touch with the West Tennessee Agricultural Experiment Station, and with the memory of the West Tennessee Farmers' Institute fresh in their minds it should be an easy matter to enthuse a sufficient number of boys to organize several corn clubs, and we suggest that some public spirited, enterprising man take the matter in hand. That which is everybody's business is nobody's business, and in order to put such a project on a proper footing some one must take the initiative.

The Sun is more than willing to do its part in encouraging and boosting the organization of corn clubs, and it goes without saying that the Jackson Fair Association will do it, and now is the time to begin.

Who will be the first boy to go to work? Don't all speak at once, but it would be well if all went to work at once, and it is our firm opinion that if they do a Madison County boy will have an even chance with boys from any other part of Tennessee to win the first prize at the State Fair next fall.

CONDITIONS IN THE SEED TRADE OF TENNESSEE.

BY A. L. GARRISON, CHIEF FEED AND SEED INSPECTOR.

The average reader may not know that many thousands of dollars have been expended and are today being expended by the Federal government to investigate the enormous amount of weeds throughout the country, also their origin. The loss to farmers in the United States alone due to weed seeds is over one hundred million dollars annually. When we stop to consider the loss, we naturally begin to think of some remedy. We first are brought to realize that the weed could, by proper cooperation and cultivation, be exterminated, or at least greatly reduced. To be plain, the farmer today who raises a crop of wheat, corn, oats or barley is paid according to the way the crop is graded when purchased from him. If his crop contains a large per cent of bind weed, cockle, pig weed, thistle, rag weed, fox tail, or, in fact, any kind of weed seeds, he is docked so much for the estimated per cent of weed seed, and the crop is consequently lowered in grade. In other words, the farmer loses money on account of the weed seed content in his grain, and in the cutting of the crop it is quite likely that many of these weed seeds are scattered over the stubble, and if fall plowing is done they are again returned to the ground for another crop. Now, you will note that the farmer has lost money in the dockage. What becomes of the dockage? The farmer's grain goes to the elevator. The elevator cleans it and makes it a higher grade of grain by screening out the dockage. Again, what becomes of the screenings? Many carloads are sold to manufacturers of so-called balance rations of poultry feed and horse and mule feed. Under the term of miscellaneous recleaned field seeds, weed seeds are transmitted to the consumer in the guise of poultry feed at an average price of \$2.00 per cwt. for a scratch feed and \$2.50 per cwt. for chick feed. But one fact is indisputable—that no consumer can afford to pay a freight rate on bind weed, pig weed or any such injurious weed seed for the privilege of feeding chickens. A wheat price for weed seed does not mean economy for the consumer of poultry feeds; besides, these weed seeds are light and are liable to be blown over arable land and result in a fine crop of weeds for the consumer, for which he had the privilege of paying grain prices.

THE VALUE OF INTELLIGENT SEED SELECTION.

From the result of eighty-two samples of field seed tests made recently, circumstances seem to call for a warning on the matter of the

quality of seed offered for sale in the State. It is the progressive and successful farmers who are coming more and more to realize the importance of the quality of seed used for planting as well as better varieties and improved methods and machinery. There are many uncontrollable factors of loss in agriculture, but a great and preventable one is the planting of poor seed. There is sown annually a great amount of poor seed, which often contain, or is adulterated with, the seeds of vile weeds which frequently cause great injury and loss to

TENNESSEE SEED LAW.

Our seed law prohibits any person from selling, exposing or offering for sale, for the purpose of seeding, any agricultural seed unless the same be free from the seeds of the following weed seed: Wild mustard, quick grass, Canada thistle, wild oats, clover and alfalfa dodder, field dodder, corn cockle, sour dock, wild onions, and oxeye daisy. The above are positively forbidden. The following weed seed are allowed in limited quantities, but are considered as impurities: White cockle, night flowering catchfly, curled dock, smooth dock, sheep sorrel, yellow trefoil, burr clover, sweet clover, black mustard, buck-horn, plantain, bind weed, smooth crab grass, common chick weed. When any of the above impurities are present in quantities exceeding a total of two per cent of the weight of said agricultural seed, then it is the duty of the seedman to place a statement on each bag or parcel stating the exact fact. While the seed men of the State are largely high-class, progressive business men, there are many violations of the above exceedingly very important provisions.

THE SEEDMAN NOT THE ONLY SINNER IN THE BUSINESS.

The undesirable condition of the seed trade rests quite as much with the mass of farmers who demand low-priced seed as with the dealers who meet the demand. When the farmers realize that some other consideration aside from merely the price must be the guide in purchasing, and that low-priced seed is not the cheapest, the very best seed that can be bought is the cheapest. When they will have nothing but the best grade, the dealers will be compelled to meet the demand. A large part of the dealer's profit is derived from the sale of screenings and low-grade seed. For instance, when good seed is selling for 15 cents per pound and the farmer demands a cheaper grade, the dealer will mix screenings and low-grade seed worth 3 or 5 cents per pound with the better grade seed to make the various cheaper grades. The mixing, of course, is done proportionally to the price, and to the

profit of the dealer and to the loss of the farmer. An examination of samples of seed offered for sale by farmers is also convincing that he is not too particular about what he sells. Farmers of certain sections produce a small amount of field seed, which they sell to their neighbors and to local dealers. This may be good seed, but it very often is not, as the farmers are not careful to keep the fields free from weeds, and do not have the machinery necessary to clean the seed properly. It therefore often contains a high per cent of noxious weed seed and dirt.

FEED THE YOUNG STOCK LIBERALLY.

The critical period of a young colt's or calf's life is from the time it ceases to receive its mother's milk until it is about a year old. Most calves and colts born in the spring are weaned in the fall. This is the season of dry feeding on short pastures. Young animals, above all others, must have succulent or green feeds or milk to grow and thrive at their best. This is why the first winter is generally recognized as the critical period in the lives of these animals; but, as a matter of fact, the critical period usually comes before the first winter. It is during the fall, October 1 to November 15, when so many of them, after being weaned, are compelled to find their living on pastures unsuited to their needs.

It is not always that the pastures are short, although that is usually the case, but the old and weathered grasses are dry, tough and indigestible and entirely unsuited to the needs of these young animals, even though abundant. Many a likely colt or calf in September, at weaning time, is a poor weakling by December through neglect of the care and feed such a young animal needs. If the young calf or colt is ever to receive a liberal allowance of grain, it needs it most and will make the best use of it from the time it is weaned until it is a year old or until it can get the young and nutritious grasses of the best spring pastures. It is not enough that these young animals be fed grain this winter when the weather is bad, but they need it now—from October to April. Neither is it enough that they get corn and corn fodder, or corn and grass hay; they need and must have, to do well, a liberal allowance of legume hay and corn, or, what is still better, legume hay and oats.

Don't neglect these young things until they get so poor that you are forced to feed them something to keep them from dying. Start right now and feed liberally. If you do not intend to do this, it will be most profitable to sell such animals before they are weaned.—*Tait Butler, in The Progressive Farmer.*

TENNESSEE SEED LAW.

CHAPTER 395.

HOUSE BILL No. 574.

AN ACT to regulate the sale of agricultural seeds, to provide a standard of purity for such seeds, to prescribe penalties for the violation of this Act, and vesting the execution and enforcement of this Act in the Commissioner of Agriculture.

SECTION 1. *Be it enacted by the General Assembly of the State of Tennessee*, That every parcel, package or lot of agricultural seeds as hereafter defined in this Act, and containing one pound or more, offered or exposed for sale in the State of Tennessee, for use within this State, shall have affixed thereto, in a conspicuous place on the outside thereof, distinctly printed, or plainly written, in the English language, a statement certifying:

First—The name of seed.

Second—Full name and address of the seedman, importer, dealer or agent.

Third—A statement of the purity of the seed contained, specifying the kind and percentage of the impurities as defined in this Act; provided, that said seeds are below the standard fixed in this Act.

Fourth—Locality where said seed was grown, and when grown.

SEC. 2. *Be it further enacted*, That the term agricultural seeds, as used in this Act, shall include the seeds of the red clover, white clover, alsike clover, alfalfa, Kentucky bluegrass, timothy, brome grass, orchard grass, red top, meadow fescue, oat grass, rye grass and other grasses and forage plants, flax, rape and cereals.

SEC. 3. *Be it further enacted*, That no person shall sell, offer or expose for sale or distribution in this State, for the purpose of seeding, any of the agricultural seeds as defined in Section two (2) of this Act, unless the said seeds are free from the seeds of the following weeds: Wild mustard or charlock (*Brassica sinapistrum*), quick grass (*Agropyron repens*), Canada thistle (*Cnicus arvensis*), wild oats (*Avena fatua*), clover and alfalfa fodder (*Cuscuta epithyllum*), field fodder (*Cuscuta arvensis*), corn cockle (*Lychnis githago*), sour dock, wild onions, and oxeye daisy.

SEC. 4. *Be it further enacted*, That the seeds of the following weeds shall be considered as impurities in the agricultural seeds as defined in Section two (2) of this Act, sold, offered or exposed for

sale, within the State, for the purpose of seeding: White cockle (*Lychnis vespertina*), night flowering catchfly (*Silene noctiflora*), curled dock (*Rumex crispus*), smooth dock (*Rumex altissimis*), sheep sorrel (*Rumex acetosella*), yellow trefoil (*Medicago lupulina*), burr clover (*Medicago denticula*), sweet clover (*Melilotus alba* and *officinalis*), black mustard (*Brassica nigra*), plantain, buck-horn (*Plantago lanceolata*), bracted plantain (*Plantago aristata*), bindweed (*Convolvulus sepium*), smooth crab grass (*Panicum glabrum*), common chick weed (*Stellaria media*). When such impurities, or any of them, are present in quantity exceeding a total of two per cent of the weight of said agricultural seeds, the approximate percentage of each shall be plainly indicated in statement specified in Section one (1) of this Act.

SEC. 5. *Be it further enacted*, That sand, dirt, chaff and foreign substances and seeds other than those specified in Sections six (6) and seven (7), or broken seed and seed not capable of germinating, shall be considered impurities when present in agricultural seed sold, offered or exposed for sale, in this State, for the purpose of seeding; and when such impurities, or any of them, are present in quantity exceeding the standards of purity and viability authorized in Section nine (9) of this Act, the name and approximate percentage of each shall be plainly indicated in the statement specified in Section one (1) of this Act.

SEC. 6. *Be it further enacted*, That for the purposes of this Act, seeds shall be deemed to be mixed or adulterated—

First—When orchard grass (*Dactylis glomerata*) seed contains ten per cent or more by weight of meadow fescue (*Fescuca elatior patensis*) seed, or Italian rye grass (*Lolium Italicum*) seed, or English rye grass (*Lolium perenne*) seed.

Second—When bluegrass or Kentucky bluegrass (*Poa pratensis*) seed contain five per cent or more by weight of Canada bluegrass (*Poa compressa*) seed, red top chaff, red top (*Agrostis alba*) seed, or any other seed or foreign substance.

Third—When red clover (*Trifolium pratense*), mammoth red clover (*Trifolium pratense* var.), or alfalfa (*Medicago sativa*) contains five per cent or more by weight of yellow trefoil (*Medicago lupulina*), or sweet clover (*Melilotus alba* and *M. officinalis*) seed, or burr clover (*Medicago denticulata*) seed.

Fourth—When rape (*Brassica rapa*) contains five per cent or more of common mustard (*Brassica sinapistrum*), or black mustard (*B. nigra*).

SEC. 7. *Be it further enacted*, That for the purposes of this Act, seed shall be deemed to be misbranded:

First—When meadow fescue (*Festuca elatior pratensis*), English rye grass (*Lolium perenne*), or Italian rye grass (*Lolium Italicum*) is labeled or sold under the name of orchard grass (*Dactylis glomerata*) seed.

Second—When Canadian blue grass (*Poa compressa*) seed, red top (*Agrostis alba*) seed, or any other seed not blue grass seed, is sold under the name of Kentucky blue grass, or blue grass (*Poa pratensis*) seed.

Third—When yellow trefoil (*Medicago lupulina*), burr clover (*Medicago denticula*), or sweet clover (*Melilotus alba*) is sold under the name of clover, June clover, red clover (*Trifolium pratense*), medium red clover, small red clover, mammoth red clover, sapling clover, peavine clover (*T. pratense* var.), or alfalfa (*Medicago sativa*) seed.

Fourth—When the seeds are not true to the name under which they are sold.

SEC. 8. *Be it further enacted*, That the provisions concerning agricultural seeds contained in this Act shall not apply to:

First—Any person or persons growing or selling seeds for food purpose only, or having such seeds in possession for sale for such purpose.

Second—Any person selling seeds direct to merchants to be cleaned or graded before being offered for sale for the purpose of seeding. This shall not, however, exempt the seller from the restrictions of Section three (3) of this Act.

Third—Seed that is held in storage for the purpose of being re-cleaned and which has not been offered, exposed or held in possession of or for sale for the purpose of seeding.

Fourth—Seed marked “not absolutely clean,” and held or sold for export outside of the State only.

Fifth—The sale of seed that is grown, sold and delivered by any farmer on his own premises for seeding by the purchaser himself, unless the purchaser of said seed obtains from the seller at the time of the sale thereof a certificate that the said seed is supplied to the purchaser subject to the provisions of this Act.

Sixth—Mixtures of seed for lawn or pasture purposes. This shall not, however, exempt the seller of such mixtures of seed from the restrictions of Sections three (3) and four (4) of this Act.

SEC. 9. *Be it further enacted*, That the following standards of

purity (meaning freedom from weed seeds or other seeds) and viability are hereby fixed:

STANDARD OF PURITY AND VIABILITY OF AGRICULTURAL SEEDS.

Name of Seeds.	Per Cent of Purity.	Per Cent of Germinable Seed.
Alfalfa (<i>Medicago sativa</i>)	96	80
Barley	98	90
Blue grass, Canadian (<i>Poa compressa</i>)	90	45
Blue grass, Kentucky (<i>Poa pratensis</i>)	80	45
Brome, awnless (<i>Bromus inermis</i>)	90	75
Clover, alsike (<i>Trifolium hybridum</i>)	90	75
Buckwheat	96	90
Clover, crimson (<i>Trifolium incarnatum</i>)	98	85
Clover, red (<i>Trifolium pratense</i>)	92	80
Clover, white (<i>Trifolium repens</i>)	90	75
Corn, field (<i>Zea mays</i>)	99	94
Corn, sweet	99	75
Fescue, meadow (<i>Festuca pratensis</i>)	95	85
Flax (<i>Linum usitatissimum</i>)	96	89
Millet, common (<i>Setaria Italica</i>)	90	85
Millet, pearl (<i>Pennisetum typhoideum</i>)	99	65
Millet, hog (<i>Panicum miliaceum</i>)	90	85
Oats (<i>Avena sativa</i>)	98	90
Oat grass, tall (<i>Arsnenatherum avenaceum</i>) ..	72	70
Orchard grass (<i>Dactylis glomerata</i>)	70	70
Rape (<i>Brassica rapa</i>)	99	90
Red top (<i>Agrotis alba</i>)	90	70
Rye (<i>Secale cereale</i>)	98	90
Rye grass, perennial (<i>Lolium perenne</i>)	96	90
Rye grass, Italian (<i>Lolium Italicum</i>)	95	80
Sorghum (<i>Andrepogon sorghum</i>)	96	80
Sorghum, for fodder	96	60
Timothy (<i>Phleum pratense</i>)	96	85
Wheat (<i>Triticum</i>)	98	90

SEC. 10. *Be it further enacted*, That it is hereby made the duty of the Commissioner of Agriculture to enforce the provisions of this Act. The inspectors, assistants and chemists appointed by the Commissioner of Agriculture shall perform the same duties and have the same authority under this Act as are prescribed by Chapter four hun-

dred and sixty-five (465) of the Acts of the General Assembly of 1907, and the said Commissioner of Agriculture may appoint such analysts and chemists as may be necessary to carry out the provisions of this Act.

SEC. 11. *Be it further enacted*, That whosoever sells, offers or exposes for sale any of the seeds specified in Sections six (6) and seven (7) of this Act, which are mixed, adulterated or misbranded, or any agricultural seeds which do not comply with Sections three (3), four (4) and five (5) of this Act, or who shall counterfeit or use a counterfeit of any of the tags prescribed by this Act; or who shall prevent or attempt to prevent any inspector in the discharge of his duty from collecting samples; or who shall violate any of the provisions of this Act, shall be guilty of a misdemeanor, and, upon conviction, shall be fined not more than one hundred dollars (\$100.00) and costs of prosecution; provided, that no one shall be convicted for violation of the provisions of Section three (3) of this Act if he is able to show that the weed seeds named in Section three (3) are present in quantities not more than one in ten thousand, and that due diligence has been used to find and remove said seeds.

SEC. 12. *Be it further enacted*, That for the purpose of defraying the expenses connected with the inspection and analysis of agricultural seeds, each and every importer, dealer or agent, before selling, offering or exposing for sale in this State any of the agricultural seeds specified in Sections three (3), four (4) and five (5) of this Act, shall pay to the Commissioner of Agriculture an inspection fee of 2 cents per bushel on cereals, and 5 cents per bushel on grasses and clovers; one-half bushel and less of cereals, 1 cent; one-half bushel grasses or clovers, 3 cents; one-fourth bushel and less grasses or clover, 2 cents on every parcel, package or lot of agricultural seeds. The said Commissioner of Agriculture is hereby empowered to prescribe the form of such stamps and adopt such regulations as may be necessary for the enforcement of this Act.

SEC. 13. *Be it further enacted*, That there is hereby appropriated, for the purpose of enforcing the provisions of this Act, a sum not exceeding the amount of fees and fines collected, and moneys or proceeds derived from the seizure and sale of agricultural seeds under its provisions. Such expenses shall be paid by warrant of the State Comptroller upon bills filed by the Commissioner of Agriculture. All fees collected under the provisions of this Act shall be paid into the State treasury.

SEC. 14. *Be it further enacted*, That all laws and parts of laws in conflict with this Act be and the same are hereby repealed.

SEC. 15. *Be it further enacted*, That this Act shall take effect from and after the first day of June, 1909, the public welfare requiring it.

Passed April 27, 1909.

M. HILLSMAN TAYLOR,
Speaker of the House of Representatives.

WM. KINNEY,
Speaker of the Senate.

Approved April 30, 1909.

MALCOLM R. PATTERSON, *Governor.*

IN WHICH CLASS ARE YOUR COWS.

The average cow in Wisconsin produces 200 pounds of butter, which is worth but little more than the feed she eats, according to Bulletin 226 of the College of Agriculture of the University of Wisconsin. State Fair visitors were arrested by the sign "In which Class Are Your Cows?" over four piles of butter, one of which represented the yearly product from an exceptionally good cow and included thirteen sixty-pounds tubs of butter and twenty pounds besides. Next was a pile of six tubs for good cows, three tubs and twenty pounds of the average cow and two tubs for the star boarder, which produces eighty pounds less than enough to pay her feed.

ARSENATE OF LEAD.

The above is the leading insecticide for summer use. The formula is as follows: Eight pounds arsenate of lead, fifty gallons water, or bordeaux mixture. Arsenate of lead is in the form of a thick, white paste, which dissolves readily in water. It adheres to the foliage for a long time and does not "burn" the leaves. For codling moth (apple worms) and plum curculio, also for canker worm, tent caterpillar and all insects which eat the leaves.

Biddy, the hen, will stand considerable thoughtful attention. She has a value to the American farmer equal to that of his wheat fields, and every day, as the sun sinks, there has been added to the store of national wealth nearly \$2,000,000. This is in the face of unsuitable housing and little by way of proper care. May the tribe of Biddy increase just as fast as the farmer learns how to give her the square hen deal!—*Farm, Stock and Home.*

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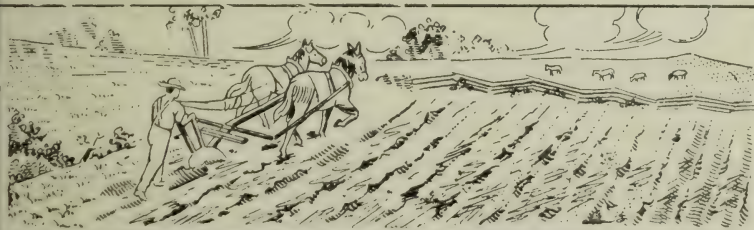
NASHVILLE
MARCH 1, 1913.

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IN THIS ISSUE:

TABULATED ANALYSES
OF
COMMERCIAL FERTILIZERS

RELATION OF BEE-KEEPING
TO HORTICULTURE



TENNESSEE AGRICULTURE

A Magazine Devoted to the Conservation and Development of the
Agricultural Interests of Tennessee

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THOMAS F. PECK, Commissioner

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MARCH 1, 1913.

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TENNESSEE BULLETIN

TABULATED ANALYSES
OF
COMMERCIAL FERTILIZERS

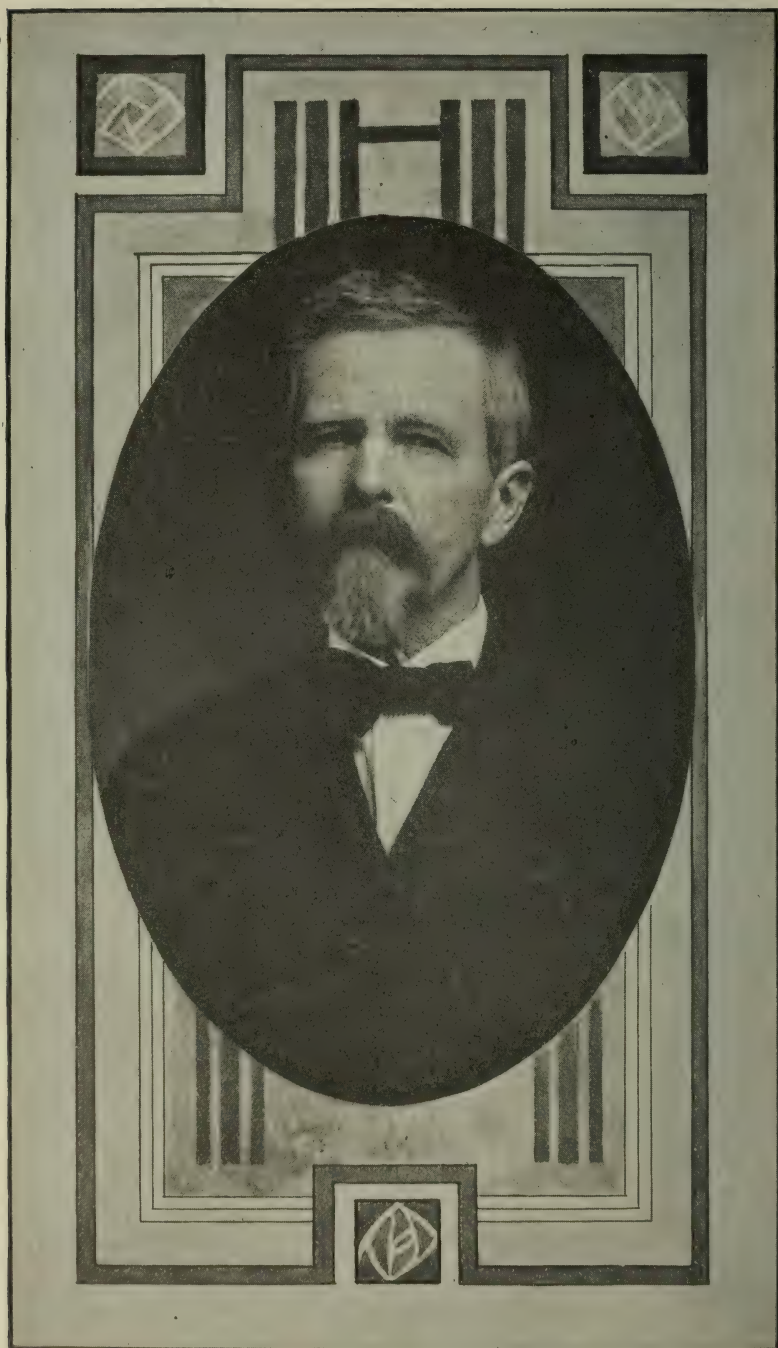
From Samples Selected, in Accordance with the Law, by the
Department of Agriculture

From January 1, 1912, to January 1, 1913

T. F. PECK, Commissioner

COMPILED BY
JESSE TOMLINSON
Assistant Commissioner for Middle Tennessee

This Bulletin Furnished Free Upon Application to this Department.



JESSE TOMLINSON.

FERTILIZER BULLETIN FOR THE YEAR 1912.

In compliance with the fertilizer laws of Tennessee I herewith submit a report of the analysis of commercial fertilizers made by the State Chemist, together with a parallel statement of guarantees registered by the manufacturers for the year 1912.

The records show that during the year there was sold to Tennessee farmers 73,743 tons of commercial fertilizer, consisting of 309 different brands, all of which were sampled and analyzed according to law.

The tonnage increase for 1912 over the year 1911 was 4,772 tons.

Of the 73,743 tons used, 28,022 went to East Tennessee, 25,810 to Middle and 19,911 to West Tennessee. Two-thirds of the shipments to the East and Middle Divisions were for the spring and summer crops. A very insignificant amount was used in the fall in West Tennessee.

Forty-nine factories registered 1,298 brands in this office for the year 1912.

The combined shipments for the last two years was 142,714 tons, as against 112,754 for the preceding two years.

The use of commercial fertilizers is steadily increasing in Tennessee, which is an indication that our soil is decreasing proportionately in fertility.

Since plant life and development requires air, water and food to sustain it, just as animal life does, it is just as important to consider the supply of food for the one as the other; it is just as poor economy to try to produce a good plant in soil depleted of plant food as it is to produce a good animal without sufficient food.

The soil being the receptacle from which the plant takes all of its food, whether the food originates from the air, water, or minerals, it is important that the soil be in the best physical condition while the plant is developing.

Nature's way for keeping the soil in this condition is letting the plant decay where it grew, thus returning to the soil the plant food extracted from the air and mineral, as well as supplying humus, which keeps the soil porous so the air and water can penetrate it.

Man can't afford to allow his crops to decay on his fields, but must take them off to supply his own needs, thus removing the plant food they have extracted from the soil, leaving his soil poorer in plant food; therefore, he must resort to a different method of keeping up the fertility of the soil.

And since the almost universal plan is to supplement the plant food with commercial fertilizers, it is important that we understand their constituency and how to use them to get the best results.

The soil should be in the best physical condition—that is, it should contain moisture sufficient to dissolve the elements of plant food contained in the fertilizer, and should be porous and well dissolved so the water can penetrate and be evenly distributed through it and that the air can circulate through it. This preparation should be of sufficient depth to contain all the water that may be precipitated during our heaviest rains in order to prevent surface washing and furnishing a reservoir that will hold the water for the plant to supply itself in a drought.

The best time for this deep preparation is in the fall, so as to have the land ready for the absorption of the winter rains. It would be better to sow a winter cover crop of rye, crimson clover, etc., in the fall, which will further protect the soil from washing, and, if plowed under in the spring, will supply humus that will be very beneficial to the growing summer crops.

The importance of having the soil in the best physical condition is emphasized when we remember that air and water cannot penetrate hard or cloddy soils and that air and water are necessary to dissolve the plant food tied up in the minerals or the commercial fertilizers so that it may be in condition to be absorbed by the plant.

If the farmer will see to it that his land is thoroughly plowed and pulverized before he applies commercial fertilizer, it is not to be doubted but that he will get much better results from their use.

There are some thirteen or fourteen elements that are necessary to plant life. Of these four are to a great extent furnished by the air, which, with the water, constitutes about 95% of the plant. Hence the necessity of having the soil so the air and water can penetrate it. The remaining nine are minerals. Phosphate, nitrogen and potash are the three elements that are generally first exhausted in the soil. A fertilizer that contains these three elements is designated as a complete fertilizer.

The intelligent use of commercial fertilizers demands that the farmer first understands what element or elements of plant food his soil is deficient in. Second, what element his crop will need for its development. If he finds his soil deficient only in one, then he should supply only that one, for it would be extravagant to use elements with which the soil is amply supplied.

It seems to the writer that it would be better to buy commercial fertilizers on the unit basis instead, as is the custom, of buying on the ton basis. It is pounds of phosphoric acid, nitrogen or potash the consumer wants and not tons of fertilizer. Farmers often pay practically the same price for different brands whose composition make their commercial values vary materially. There is nothing in a brand name. It usually stands for what the manufacturer wishes the farmer to think is best for his crop, that he, the manufacturer, may dispose of his products to the best advantage for himself. The idea is that the farmer should know what ingredients he needs and buy them at a definite price per unit, instead of buying brands on the ton basis.

Fertilizer ingredients may be bought mixed or unmixed in proportions which may suit the farmer's needs, but in either case on the unit basis.

A unit is 1% of a ton, or 20 pounds of the material. The figures that show the guaranteed analysis express the number of units in the material. For example, suppose you buy a complete fertilizer guaranteed analysis 12% available phosphoric acid, 2% nitrogen and 4% potash. It would mean 12 units of the first, 2 of the second and 4 of the third.

In buying on this basis the dealer states how much he charges per unit for each element. Thus the farmer can see from whom he can buy the plant food at the lowest price. Then in case the goods do not come up to the guarantee a just basis of settlement is fixed.

As to whether the farmer should buy the material and do his own mixing or buy it mixed depends on whether he can mix them as well and as cheaply as the manufacturer. By subtracting the cost of the material from the cost of the mixed fertilizer you have the cost of the mixing. The process of mixing is a simple operation. It is done by spreading evenly on a tight floor the bulkiest element first, the next bulkiest next, and so on. Then commence at one side and shovel back, repeat the operation until the elements are thoroughly mixed. Be sure the materials are finely ground.

The commercial and agricultural value of fertilizer materials are not synonymous terms.

The commercial value is determined by the cost of the materials contained in the formula. The agricultural value is determined by the increased yield or quality produced by it in the crops. The costly fertilizer may be low in agricultural value, and vice versa.

In calculating the values given in this report it is not undertaken to

say what the retail prices of fertilizers should be in this State. The values given are for the amounts of the raw, unmixed material represented by the analysis and do not consider the cost of grinding, mixing, bagging, insurance, etc.

The values given in the following tables are as nearly as can be determined the prices at which the fertilizer ingredients in raw materials of good quality can be bought at retail for cash. These prices fluctuate as all other commodities, but whether they are exact or not, they serve the purpose of comparing the values based on the guaranteed analysis and those based on the analysis of the State Chemist. Besides, the calculation of values upon different guaranteed analyses enables the purchaser to determine which dealer offers plant food at the lowest price, provided, of course, that the materials are of the same quality.

In reading this report the first things to consider are the materials used and the analysis as compared with the guarantee. It seldom happens that the State Chemist finds an exact duplicate of the guarantee, but the variation should not be so great as to change the nature of the fertilizer. Such a variation might take place and at the same time value calculated upon the analysis be greater than the value calculated upon the guarantee; for example: A farmer might want a fertilizer high in potash and low in nitrogen and get one low in potash and high in nitrogen. In this case, nitrogen being the higher priced material, thus he gets the fertilizer of greater commercial value, but may be of less agricultural value. Several variations of this kind are to be found in the following tables.

To calculate the value of a ton of fertilizer multiply the value of a pound of each ingredient by twenty and multiply this product by the percentages of the several ingredients and add the results, for example: Suppose we are calculating this formula: Available phosphoric acid, 10%, nitrogen 2%, potash 4%. Say phosphoric acid is worth 5 cents per pound, nitrogen 16½ cents, potash 5 cents. Then 5 by 20 by 10 equals \$10.00; 16½ by 20 by 2, \$6.60. Then 5 by 20 by 4, \$4.00. Then add these results and you have \$20.60, the price.

Farmers are requested not to purchase fertilizers that are not labeled to meet the requirements of law.

Any manufacturer who does not label his goods according to the requirements of law is subject to prosecution and should not be patronized. It may be and does happen that the manufacturer misses his guarantee without intending it, but if the packages are not labeled according to law it must be intentional or gross carelessness. Farmers

can render great assistance in enforcing the law by reporting any violation to the Department of Agriculture. This they should willingly do, since the purpose of the law is solely for the consumer's protection. Every package or bag of fertilizer or fertilizer material should carry a label or printed on the package the following:

The name and address of the manufacturer and the place of manufacture. Second, the name and brand of fertilizer; third, guaranteed analysis, giving percentage of available phosphoric acid, nitrogen and potash, or such of these ingredients as may be claimed; fourth, each sack or package should contain a tax tag which must bear the facsimile signature of T. F. Peck, Commissioner.

The following are current prices for fertilizer material for the year 1912:

High-grade ground blood.....	\$ 3.40 per unit
Ground fish	3.75 per unit
High-grade tankage	3.35 per unit
Nitrate of soda	60.00 per ton
Cottonseed meal	28.00 per ton
Sulphate of ammonia.....	3.20 per unit
Ground phosphate rock, B. P. L.....	6 to 8.75 per ton
Acid phosphate, 16 per cent	14.00 per ton
Muriate of potash, 50 per cent	50.00 per ton
Kanit, 12 per cent	16.00 per ton
Sulphate of potash, 50 per cent	55.00 per ton
Manure salt	25.00 per ton
Available phosphoric acid.....	.05 per pound
Nitrogen .....	.16 per pound
Potash .....	.05 per pound

On the following pages will be seen the tabulated report showing the elements found in each formula by the State Chemist, and its value per ton according to that finding, together with a parallel statement of the guaranteed analysis with the value per ton according to the guarantee.

By reference to the tables it will be seen that twenty-four formulas fall below the guarantee, and thus violate the third section of the Tennessee fertilizer law. However as many of the formulas run above the guarantee, it is reasonable that the discrepancies are the result of careless mixing.

OFFICIAL ANALYSIS FOR 1912 ---COMPLETE FERTILIZERS.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phos-	Nitrogen	Potash	Commercial Value	Avialble Phos-	Nitrogen	Potash	Commercial Value	
2346	George's Truck Grower..	A. H. George, Meridian, Miss.	Clement Bros., Humboldt, Tenn.	10.00	3.30	4.00	\$24.89	9.45	2.49	3.57	\$21.23	Good
2350	Adair's Ammoniated Dissolved Bone	A. D. Adair & McCarty Bros., Chattanooga, Tenn.	Baldwin Feed & Imp. Co., Johnson City, Tenn.	8.00	1.65	2.00	15.45	9.26	1.21	2.50	15.75	Good
2355	Armour's Hoosier Corn Grower	Armour's Fert. Works, Nashville, Tenn.	Jas. A. Boyd, Jonesboro, Tenn.	8.00	.82	4.00	14.70	10.60	.83	2.48	15.82	Good
2358	Armour's H. G. Potato Grower	Armour's Fert. Works, Nashville, Tenn.	Jas. A. Boyd, Jonesboro, Tenn.	8.00	1.65	10.00	23.45	9.91	2.06	5.60	22.31	Good
2359	Armour's Grain Grower..	Armour's Fert. Works, Nashville, Tenn.	Jas. A. Boyd, Jonesboro, Tenn.	8.00	1.65	2.00	15.45	8.03	1.73	2.11	15.85	Good
2361	Davie & Whittle's Owl Brand for Tobacco....	Va.-Carolina Chem. Co., Richmond, Va.	W. P. Diehl, Jonesboro, Tenn.	8.35	1.65	2.00	15.80	8.45	1.73	2.52	16.68	Good
2365	High Grade Scott's Gypsum Potass.	Va.-Carolina Chem. Co., Richmond, Va.	W. P. Diehl, Jonesboro, Tenn.	8.00	1.65	7.00	20.45	9.05	1.85	7.64	22.79	Good
2370	Northwestern Horseshoe Potash Manure	American Agricultural Chem. Co., Cincinnati, Ohio	J. M. Ward, Jonesboro, Tenn.	8.00	.82	3.00	13.70	9.23	1.11	3.22	16.11	Good
2371	Baugh's Animal Bone & Pot. Comp. for all crops	Baugh & Sons, Philadelphia, Pa.	J. M. Ward, Jonesboro, Tenn.	8.00	1.65	2.00	15.45	9.09	1.76	2.17	17.06	Good
2374	Bird's 2-8-2 Baker's Std. Guano for tobacco	The J. R. Young Fert. Co., Nashville, Tenn.	Bird Bros., Greeneville, Tenn.	8.00	1.65	2.00	15.45	8.90	1.52	2.29	16.21	Good
2375	Std. Davie & Whittle's Owl Brand Guano for tobacco	Va.-Carolina Chem. Co., Richmond, Va.	Bird Bros., Greeneville, Tenn.	8.35	1.65	2.00	15.80	8.59	1.90	2.58	17.44	Good

2380	Buffalo Bone Fert.	Furman's Farm Improvement Co., Atlanta, Ga.	H. L. Milligan, Greenville, Tenn.	8.00	1.65	2.00	15.45	8.24	1.53	2.25	15.54	Good
2381	Daybreak Special Tobacco Grower	Federal Chemical Co., Louisville, Ky.	M. S. Roberts & Sons, Greenville, Tenn.	8.00	1.23	6.00	18.05	9.94	1.94	3.90	20.24	Good
2382	Standard Corn & Wheat Grower	Federal Chemical Co., Louisville, Ky.	M. S. Roberts & Sons, Greenville, Tenn.	8.00	1.65	2.00	15.45	8.49	1.59	2.37	16.10	Good
2384	Standard Crop Tobacco Grower	Federal Chemical Co., Louisville, Ky.	M. S. Roberts & Sons, Greenville, Tenn.	8.00	.82	4.00	14.70	9.42	1.10	3.88	16.93	Good
2385	Globe Special Tobacco Grower	Globe Fert. Co., Louisville, Ky.	M. S. Roberts & Sons, Greenville, Tenn.	8.00	2.47	10.00	26.15	9.09	2.47	10.82	28.06	Good
2387	Read's Blood & Bone.	Read Phosphate Co., Nashville, Tenn.	The Beck-Tarver Co., Knoxville, Tenn.	8.00	1.65	2.00	15.45	8.48	1.90	2.07	16.82	Good
2389	Tarver's Triumph	Read Phosphate Co., Nashville, Tenn.	The Beck-Tarver Co., Knoxville, Tenn.	12.00	1.65	4.00	21.45	12.91	1.77	3.99	22.74	Good
2393	Ox Slaughter House Bone	Tennessee Chemical Co., Nashville, Tenn.	W. W. Woodruff, Knoxville, Tenn.	8.00	1.65	2.00	15.45	9.40	1.68	2.04	16.98	Good
2394	Special Ox Tomato Grower	Tennessee Chemical Co., Nashville, Tenn.	W. W. Woodruff, Knoxville, Tenn.	10.00	2.47	3.00	21.15	9.88	2.81	4.67	23.32	Good
2395	Bear's Complete Guano. .	Continental Fert. Co., Nashville, Tenn.	D. R. Mayo, Knoxville, Tenn.	8.00	1.65	2.00	15.45	10.56	1.24	1.86	16.51	Good
2396	Bear Beef Blood & Bone.	Continental Fert. Co., Nashville, Tenn.	D. R. Mayo, Knoxville, Tenn.	10.00	1.65	2.00	17.45	10.33	1.67	2.35	18.19	Good
2397	Ashcraft's Special	Tennessee Valley Fert. Co., Florence, Ala.	D. R. Mayo, Knoxville, Tenn.	10.00	1.65	2.00	17.45	11.17	2.23	2.33	20.86	Good
2398	Bear Vegetable Fert. ...	Continental Fert. Co., Nashville, Tenn.	D. R. Mayo, Knoxville, Tenn.	8.00	1.65	5.00	18.45	8.77	2.18	3.34	19.30	Good
2399	Bear High Grade Guano.	Continental Fert. Co., Nashville, Tenn.	D. R. Mayo, Knoxville, Tenn.	10.00	2.46	3.00	21.12	10.01	2.65	3.08	21.84	Good
2400	Special Vegetable Grower	Tennessee Valley Fert. Co., Florence, Ala.	D. R. Mayo, Knoxville, Tenn.	8.00	1.65	4.00	17.45	12.53	1.57	6.44	24.15	Good
2401	Bear Special Truck Guano	Continental Fert. Co., Florence, Ala.	D. R. Mayo, Knoxville, Tenn.	10.00	3.30	4.00	24.89	9.38	3.31	1.76	22.06	Good

OFFICIAL ANALYSES FOR 1912—COMPLETE FERTILIZERS—Continued.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	
2402	Monarch	Tennessee Valley Fert. Co., Florence, Ala.	D. R. Mayo, Knoxville, Tenn.	8.00	1.65	2.00	15.45	8.69	2.27	2.56	18.74	Good
2404	Read's High Grade Tobacco Special	To-Read's Phosphate Co., Nashville, Tenn.	H. G. Banks, Springfield, Tenn.	8.00	1.65	8.00	21.45	9.12	1.86	6.96	22.22	Good
2405	Armour's 2-10-2	Armour's Fert. Works, Nashville, Tenn.	Lowe-Hord Hdwe. Co., Knoxville, Tenn.	10.00	1.65	2.00	17.45	11.00	1.66	2.06	18.54	Good
2406	Armour's 4-8-4	Armour's Fert. Works, Nashville, Tenn.	Lowe-Hord Hdwe. Co., Knoxville, Tenn.	8.00	3.30	4.00	22.89	7.02	3.16	4.67	22.12	Good
2407	Sunny South Cotton Grower	Federal Chemical Co., Louisville, Ky.	E. W. Gillespie, Knoxville, Tenn.	10.00	.82	2.00	14.70	10.63	.91	2.13	15.76	Good
2410	Daybreak H. G. Fert.	Federal Chemical Co., Louisville, Ky.	E. W. Gillespie, Knoxville, Tenn.	10.00	1.65	2.00	17.45	11.55	1.63	1.98	18.91	Good
2413	Special Vegetable Compound	Chickamauga Fert. Works, Chattanooga, Tenn.	Wright Hardware Co., Knoxville, Tenn.	10.00	1.65	4.00	19.45	9.85	1.66	4.69	20.02	Good
2414	Chickamauga Blood, Bone and Tankage	Chickamauga Fert. Works, Chattanooga, Tenn.	Wright Hardware Co., Knoxville, Tenn.	9.00	.82	2.00	13.70	10.34	.90	1.45	14.76	Good
2417	Chickamauga H. G. Fert.	Chickamauga Fert. Works, Chattanooga, Tenn.	Wright Hardware Co., Knoxville, Tenn.	10.00	1.65	2.00	17.45	10.54	1.45	2.17	17.49	Good
2418	Soluble Vegetable Manure	Globe Fert. Co., Louisville, Ky.	Market Hdwe. & Harness Co., Knoxville, Tenn.	8.00	1.65	5.00	18.45	9.40	1.78	5.22	20.49	Good
2419	Globe Potato Guano	Globe Fert. Co., Louisville, Ky.	Market Hdwe. & Harness Co., Knoxville, Tenn.	8.00	3.29	4.00	22.85	9.40	2.27	4.73	29.78	Good

2422	Tomato Grower	Tuscarora Fert. Co., Nashville, Tenn.	Hale & Dungan, Gibson, Tenn.	8.00	3.30	4.00	22.89	8.71	2.90	3.45	21.73	Good
2423	Truck Grower	Tuscarora Fert. Co., Nashville, Tenn.	Hale & Dungan, Gibson, Tenn.	10.00	3.30	4.00	24.89	10.27	3.45	4.38	26.03	Good
2424	Warmath's H. G. Vegetable Grower	National Fert. Co., Nashville, Tenn.	J. T. Warmath, Gibson, Tenn.	8.00	4.92	5.00	29.24	9.49	4.38	4.44	28.38	Good
2425	Special Vegetable Grower	National Fert. Co., Nashville, Tenn.	J. T. Warmath, Gibson, Tenn.	8.00	3.30	5.00	23.89	9.98	3.45	4.78	26.14	Good
2426	Memphis Truck Special	Va.-Carolina Chemical Co., Memphis, Tenn.	M. F. Hamilton, Humboldt, Tenn.	8.00	3.30	4.00	22.89	8.82	3.41	4.20	24.27	Good
2427	H. G. Royal Fruit Grower	Va.-Carolina Chemical Co., Memphis, Tenn.	M. F. Hamilton, Humboldt, Tenn.	8.00	2.47	5.00	21.15	8.70	3.02	5.60	24.27	Good
2429	Ox Truck Special Guano	Tennessee Chemical Co., Nashville, Tenn.	Bob Hemphill, Medina, Tenn.	10.00	3.30	4.00	24.89	10.37	2.71	3.34	23.25	Good
2430	Black Patch Tobacco Special	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Lewis & Moss, Martin, Tenn.	8.00	1.65	10.00	23.45	9.59	1.76	9.27	24.67	Good
2431	Tenn. & Ky. Tobacco Grower	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Lewis & Moss, Martin, Tenn.	8.00	1.65	4.00	17.45	8.21	2.00	4.15	18.96	Good
2432	Ox Truck Guano	Tennessee Chemical Co., Nashville, Tenn.	L. C. James, Humboldt, Tenn.	8.00	3.30	4.00	22.89	9.73	3.65	3.56	25.34	Good
2433	Ready Tobacco Grower	Read Phosphate Co., Nashville, Tenn.	L. C. James, Humboldt, Tenn.	8.00	3.30	4.00	22.89	8.89	2.85	3.80	21.89	Good
2434	Ox Special Truck Guano	Tennessee Chemical Co., Nashville, Tenn.	L. C. James, Humboldt, Tenn.	10.00	3.30	4.00	24.89	13.03	2.79	2.13	24.36	Good
2435	Armour's Truck Grower	Armour's Fert. Co., Nashville, Tenn.	E. R. Nelson, Humboldt, Tenn.	10.00	3.30	4.00	24.89	10.76	3.18	3.95	25.20	Good
2437	V. 3 C. Fruit & Truck	Va.-Carolina Chemical Co., Memphis, Tenn.	M. F. Hamilton, Humboldt, Tenn.	6.00	3.30	8.00	24.89	7.04	3.66	5.99	25.10	Good
2438	G. S. Garden Special	Great Southern Phos. Co., Mt. Pleasant, Tenn.	C. M. Dees, Henderson, Tenn.	10.00	3.23	4.00	24.85	11.73	3.22	3.90	26.25	Good
2439	Potato & Vegetable Special	Great Southern Phos. Co., Mt. Pleasant, Tenn.	C. M. Dees, Henderson, Tenn.	7.00	2.47	6.00	21.15	8.75	2.24	2.93	19.07	Good

OFFICIAL ANALYSES FOR 1912—COMPLETE FERTILIZERS—Continued.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phos-phoric Acid	Nitrogen	Potash	Commercial Value	Available Phos-phoric Acid	Nitrogen	Potash	Commercial Value	
2440	Tiger Truck Special	Tennessee Valley Fert. Co., Florence, Ala.	E. L. Fessnire, Lexington, Tenn.	8.00	3.30	4.00	22.89	8.81	4.33	3.78	26.88	Good
2441	Empire Dissolved Animal Bone	Empire Carbon Works, National Stock Yards, Ill.	E. J. Craddock, Humboldt, Tenn.	8.00	3.30	4.00	22.89	10.30	3.35	3.55	24.90	Good
2442	Warmath's Vegetable Grower	National Fert. Co., Nashville, Tenn.	J. T. Warmath, Gibson, Tenn.	8.00	3.30	4.00	22.89	8.93	2.25	4.44	20.79	Good
2443	Armour's All Soluble	Armour's Fert Co, Nashville, Tenn.	H. B. Bradbury, Medina, Tenn.	8.00	2.88	4.00	21.50	9.56	2.75	3.25	21.88	Good
2444	Forked Deer Special Truckee	Tennessee Cotton Oil Co., Jackson, Tenn.	J. W. Ward & Co., Greenfield, Tenn.	8.00	2.47	4.00	20.15	8.85	2.30	4.20	20.64	Good
2445	Forked Deer Vegetable Grower	Tennessee Cotton Oil Co., Jackson, Tenn.	J. W. Ward & Co., Greenfield, Tenn.	10.00	3.29	4.00	24.85	10.65	3.05	4.18	24.94	Good
2446	Progress Corn & Wheat Grower	Globe Fert. Co., Louisville, Ky.	Smith Bros. Dorris Co., Springfield, Tenn.	10.00	.82	2.00	14.70	8.32	1.30	1.94	14.55	Good
2447	Ky. Standard Tobacco Grower	Globe Fert. Co., Louisville, Ky.	Smith Bros. Dorris Co., Springfield, Tenn.	8.00	1.65	5.00	18.45	9.03	1.55	4.73	18.92	Good
2448	Big Four Tobacco Grower	Globe Fert. Co., Louisville, Ky.	Smith Bros. Dorris Co., Springfield, Tenn.	8.00	1.65	2.00	15.45	8.49	1.78	2.19	16.55	Good
2449	Homestead Bone, Black Fert.	American Ag. Chem. Co., Cincinnati, Ohio	T. F. Bell & Co., Springfield, Tenn.	8.00	2.05	1.50	16.30	8.91	3.05	1.59	20.56	Good
2450	Red Line Crop Grower	American Ag. Chem. Co., Cincinnati, Ohio	T. F. Bell & Co., Springfield, Tenn.	8.00	1.65	2.00	15.45	8.78	1.82	1.79	16.57	Good

2452	Homestead Tobacco Grower	American Ag. Chem. Co., Cincinnati, Ohio	T. F. Bell & Co., Springfield, Tenn.	10.00	2.83	3.05	23.00	11.03	2.90	3.42	24.02	Good
2453	Potato & Tobacco Special Grower	American Ag. Chem. Co., Cincinnati, Ohio	T. F. Bell & Co., Springfield, Tenn.	8.00	1.65	5.00	18.45	8.27	1.91	5.33	19.71	Good
2454	Armour's Special Tobacco Grower	Armour's Fert. Works, Nashville, Tenn.	T. C. Holman & Son, Springfield, Tenn.	8.00	1.65	5.00	18.45	10.64	1.22	3.86	18.52	Good
2455	Armour's Raw Bone & Potash Mixt.	Armour's Fert. Works, Nashville, Tenn.	T. C. Holman & Son, Springfield, Tenn.	12.00	1.85	3.00	21.00	12.97	2.39	2.06	22.91	Good
2456	Northwestern Horse Show Brand Tobacco Fert. ..	American Ag. Chem. Co., Cincinnati, Ohio	W. E. Ryan, Springfield, Tenn.	8.00	1.65	2.00	15.45	9.85	2.02	2.15	18.66	Good
2457	Special Tobacco Grower.	Fox Chemical Co., Louisville, Ky.	J. A. Long & Co., Springfield, Tenn.	8.00	1.65	5.00	18.45	8.39	1.69	4.55	18.51	Good
2458	Bone, Blood & Potash....	Fox Chemical Co., Louisville, Ky.	J. A. Long & Co., Springfield, Tenn.	11.00	4.00	1.00	25.20	11.40	.63	.97	14.45	Good
2459	Ox Brand Special Corn Formula	Tennessee Chem. Co., Nashville, Tenn.	Henry, Woodard & Dowlen, Springfield, Tenn.	10.00	.41	2.00	13.35	11.08	.73	1.74	15.22	Good
2460	Pure Raw Bone Meal....	Nashville Guano Co., Nashville, Tenn.	Henry, Woodard & Dowlen, Springfield, Tenn.	10.00	1.65	2.00	17.45	.....	4.15	.....	13.69	Good
2461	Jumbo Tobacco Grower..	Nashville Guano Co., Nashville, Tenn.	Henry, Woodard & Dowlen, Springfield, Tenn.	10.00	1.65	2.00	17.45	11.36	2.05	2.03	20.15	Good
2462	Jumbo Corn Grower	Nashville Guano Co., Nashville, Tenn.	Henry, Woodard & Dowlen, Springfield, Tenn.	10.00	.83	1.00	13.70	11.85	.54	1.00	14.63	Good
2463	Ox Special Tobacco Guano	Tennessee Chem. Co., Nashville, Tenn.	Henry, Woodard & Dowlen, Springfield, Tenn.	10.00	1.65	2.00	17.45	11.28	1.71	1.59	18.51	Good
2464	Read's Corn & Wheat Grower	Read Phosphate Co., Nashville, Tenn.	H. G. Banks, Springfield, Tenn.	11.00	.50	1.00	12.16	11.53	.61	1.36	14.90	Good
2465	Read's Standard Tobacco Grower	Read Phosphate Co., Nashville, Tenn.	H. G. Banks, Springfield, Tenn.	8.00	1.65	2.00	15.45	9.18	2.14	2.18	18.42	Good
2466	Read's H. G. Tobacco Grower	Read Phosphate Co., Nashville, Tenn.	H. G. Banks, Springfield, Tenn.	8.00	1.65	4.00	12.45	9.69	1.70	4.79	20.09	Good
2467	Acid Phosphate	Tennessee Valley Fert. Co., Florence, Ala.	Dan G. Smart, McMinnville, Tenn.	16.00	.....	.....	16.00	16.93	.04	.28	17.34	Good

OFFICIAL ANALYSES FOR 1912—COMPLETE FERTILIZERS —Continued.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phos-	Nitrogen	Potash	Commercial Value	Available Phos-	Nitrogen	Potash	Commercial Value	
2480	Fox Brand Early Harvest	Fox Chemical Co., Louisville, Ky.	Dan G. Smart, McMinnville, Tenn.	10.00	.82	2.00	14.70	12.08	1.12	3.02	18.80	Good
2481	Fox Brand Tobacco Grower	Fox Chemical Co., Louisville, Ky.	Dan G. Smart, McMinnville, Tenn.	8.00	1.65	2.00	15.45	9.98	1.96	1.97	18.42	Good
2485	Furman Blood Bone and Tankage Guano	Furman's Imp. Co., Atlanta, Ga.	Biles-Smith Hdw. Co., McMinnville, Tenn.	9.00	.82	2.00	13.70	10.42	1.12	2.50	16.69	Good
2488	Read's Blood & Bone, No. 1	Read Phosphate Co., Nashville, Tenn.	Mennegar & Martin, McMinnville, Tenn.	8.00	1.65	2.00	15.45	10.17	1.69	2.11	17.35	Good
2490	Capitol Bone & Potash Comp.	Va.-Carolina Chemical Co., Nashville, Tenn.	W. R. Craig & Sons, Pulaski, Tenn.	10.00	.....	2.00	12.00	10.95	.10	2.30	13.58	Good
2491	Read's Special Cantaloupe Grower	Read Phosphate Co., Nashville, Tenn.	W. R. Craig & Sons, Pulaski, Tenn.	8.00	1.65	2.00	15.45	9.97	1.98	2.63	19.13	Good
2492	Read's Boss Cotton Grower	Read Phosphate Co., Nashville, Tenn.	W. R. Craig & Sons, Pulaski, Tenn.	10.00	.82	2.00	14.70	9.64	1.05	2.21	15.31	Good
2494	Read's XXX Dissolved Bone	Read Phosphate Co., Nashville, Tenn.	W. R. Craig & Sons, Pulaski, Tenn.	13.00	.....	.....	13.00	13.03	.09	.24	13.56	Good
2496	Big Success Garden Special	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	J. A. Luttrell, Loreto, Tenn.	10.00	3.23	5.00	25.85	11.98	2.11	2.80	21.94	Good
2499	Big Success Corn Special.	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	J. A. Luttrell, Loreto, Tenn.	8.00	1.65	2.00	15.45	9.76	1.71	2.09	17.49	Good
2500	Big Success Cotton Grower	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	J. A. Luttrell, Loreto, Tenn.	10.00	.82	1.00	13.70	12.72	.64	1.18	16.00	Good

2502	Lawrence County High Grade	Leoma Union Whse. & Mfg. Co., Leoma, Tenn.	JR. E. Avers, Loreto, Tenn.	8.00	.82	5.00	15.70	8.80	.65	5.19	16.13	Good
2506	Furman's Cotton Special	Furman Farm Imp. Co., Atlanta, Ga.	M. H. Weathers, Loreto, Tenn.	10.00	.82	3.00	15.70	10.44	1.04	2.86	16.67	Good
2510	King Cotton Grower	Tennessee Valley Fert. Co., Florence, Ala.	A. E. Hollander, Loreto, Tenn.	10.00	.82	1.00	13.70	10.33	.48	1.34	13.75	Good
2511	Tiger Cotton Grower	Tennessee Valley Fert. Co., Florence, Ala.	A. E. Hollander, Loreto, Tenn.	10.00	.82	1.00	13.70	13.39	1.07	1.60	18.52	Good
2512	Florence Fertilizer	Tennessee Valley Fert. Co., Florence, Ala.	A. E. Hollander, Loreto, Tenn.	10.00	1.65	2.00	17.45	15.05	1.39	2.55	22.19	Good
2517	Scott's State Standard	Va.-Carolina Chemical Co., Memphis, Tenn.	G. T. Ingram & Co., Bolivar, Tenn.	8.35	1.65	2.00	15.75	7.70	1.48	2.10	14.68	Good
2518	H. G. Cotton Belt Fert.	Tupelo Fert. Co., Tupelo, Miss.	W. W. Griggs, Gadsden, Tenn.	10.00	1.65	2.00	17.45	9.98	2.20	2.41	19.65	Good
2519	H. G. Cotton Belt Fert.	Tupelo Fert. Co., Tupelo, Miss.	W. W. Griggs, Gadsden, Tenn.	8.00	1.65	2.50	15.95	9.73	1.68	5.35	20.52	Good
2520	Tennessee Cotton Grower	Globe Fert. Co., Nashville, Tenn.	D. E. Bormar, Paris, Tenn.	10.00	.82	2.00	14.70	11.51	1.00	2.00	17.49	Good
2521	Universal Crop & Tobacco Grower	Globe Fert. Co., Nashville, Tenn.	D. E. Bormar, Paris, Tenn.	8.00	.82	4.00	14.70	18.58	1.15	3.95	26.32	Good
2522	Globe Truck Grower	Globe Fert. Co., Nashville, Tenn.	D. E. Bormar, Paris, Tenn.	8.00	.41	8.00	17.35	11.65	.44	5.74	18.82	Good
2524	Old Hickory Tobacco Grower	National Fert. Co., Nashville, Tenn.	J. T. Gatin, Paris, Tenn.	10.00	1.65	2.00	17.45	9.63	1.61	2.27	17.01	Good
2525	Old Hickory Cotton Grower	National Fert. Co., Nashville, Tenn.	J. T. Gatin, Paris, Tenn.	8.00	1.65	2.00	15.45	8.29	1.68	2.12	15.35	Good
2526	Old Hickory Corn Grower	National Fert. Co., Nashville, Tenn.	J. T. Gatin, Paris, Tenn.	10.00	.82	1.00	13.70	10.85	.93	1.78	15.69	Good
2527	Fox Cotton King	Fox Chemical Co., Louisville, Ky.	J. S. Sasson, McKenzle, Tenn.	10.00	.82	2.00	14.70	10.68	1.30	4.27	19.24	Good
2530	Blood & Bone Gnano	Tennessee Valley Fert. Co., Florence, Ala.	A. J. Manes, Finger, Tenn.	10.00	.83	2.00	14.73	10.29	.88	1.51	14.70	Good

OFFICIAL ANALYSES FOR 1912—COMPLETE FERTILIZERS—Continued.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phos-	Nitrogen	Potash	Commercial Value	Available Phos-	Nitrogen	Potash	Commercial Value	
2531	Armour's Cotton King...	Armour's Fert. Co., Nashville, Tenn.	A. J. Manes, Finger, Tenn.	8.00	1.65	2.00	15.45	9.13	1.80	2.30	17.37	Good
2532	Ox Crop Producer	Tennessee Chemical Co., Nashville, Tenn.	L. C. James, Humboldt, Tenn.	10.00	.82	3.00	15.70	11.89	1.52	4.09	20.99	Good
2533	H. G. Cotton Belt Fert...	Tupelo Fert. Co., Tupelo, Miss.	J. G. Steele, Selmer, Tenn.	10.00	3.30	4.00	24.89	12.55	3.40	4.02	27.80	Good
2534	H. G. Cotton Belt Fert...	Tupelo Fert. Co., Tupelo, Miss.	J. G. Steele, Selmer, Tenn.	10.00	.82	2.00	14.70	11.00	1.60	2.29	18.57	Good
2535	Tiger Cotton Special ...	Tennessee Valley Fert. Co., Florence, Ala.	Selmer Merc. Co., Selmer, Tenn.	10.00	1.65	2.00	17.45	8.80	1.44	2.70	16.25	Good
2536	Blood, Bone & Potash ...	Continental Fert. Co., Nashville, Tenn.	J. S. Strude, Selmer, Tenn.	11.00	.82	3.00	16.70	12.02	1.44	3.12	19.89	Good
2537	H. G. Cotton Belt Fert...	Tupelo Fert. Co., Tupelo, Miss.	N. J. Climer, Greenfield, Tenn.	10.00	2.47	3.00	21.15	13.71	2.88	3.48	23.79	Good
2538	Daybreak Favorite	Federal Chemical Co., Nashville, Tenn.	W. A. Presson, Camden, Tenn.	11.00	.82	3.00	16.70	12.63	.93	3.36	19.10	Good
2539	Triangle Fish Guano ...	Interstate Phosphate Co., Nashville, Tenn.	W. A. Presson, Camden, Tenn.	10.00	1.65	2.00	17.45	10.88	1.46	2.16	17.85	Good
2542	Royal Cotton Boll Guano	Va.-Carolina Chem. Co., Memphis, Tenn.	Humboldt, Tenn.	8.35	1.65	2.00	15.80	9.51	1.64	2.13	17.05	Good
2543	Mule Brand Tobacco Grower	American Guano Co., Nashville, Tenn.	Hare & Wall, Yuma, Tenn.	10.00	1.65	2.00	17.45	11.55	1.60	2.48	19.31	Good

2545	Dixie Corn and Cotton Grower	American Guano Co., Nashville, Tenn.	Hare & Wall, Yuma, Tenn.	8.00	1.65	2.00	15.45	7.38	2.35	4.27	19.40	Good
2546	Globe H. G. Favorite	Globe Fert. Co., Nashville, Tenn.	J. S. Blount & Co., Yuma, Tenn.	10.00	1.85	2.00	17.45	11.52	1.44	3.03	19.40	Good
2547	Eagle Cotton Grower ...	Louisville Fert. Co., Louisville, Ky.	Parsons Imp. Co., Parsons, Tenn.	10.00	.82	1.00	13.70	9.60	1.40	2.53	16.75	Good
2548	Eagle Cotton Grower ...	Louisville Fert. Co., Louisville, Ky.	Parsons Imp. Co., Parsons, Tenn.	10.00	.82	1.00	13.70	10.39	.91	1.07	14.46	Good
2549	V. C. C. Ammoniated Fert.	Va.-Carolina Chemical Co., Memphis, Tenn.	F. M. Orr, Wildersville, Tenn.	10.00	.82	3.00	15.70	11.41	1.00	1.42	16.43	Good
2550	Standard Royal Cotton Bone Guano	Va.-Carolina Chemical Co., Memphis, Tenn.	F. M. Orr, Wildersville, Tenn.	8.35	1.85	2.00	15.80	9.45	1.67	2.28	17.16	Good
2553	Tuscarora Standard	Tuscarora Fert. Co., Nashville, Tenn.	Hale & Dungan, Gibson, Tenn.	8.00	1.65	2.00	15.45	8.65	1.33	2.22	15.23	Good
2555	Extra Special Tobacco Grower	Tennessee Chemical Co., Nashville, Tenn.	Fuller Bros., Dresden, Tenn.	8.00	1.65	10.00	23.45	9.01	1.76	8.20	23.10	Good
2556	Ox Brand Tobacco Grower	Tennessee Chem. Co., Nashville, Tenn.	Fuller Bros., Dresden, Tenn.	8.00	1.65	2.00	15.45	8.76	2.11	3.10	18.90	Good
2557	Ox Brand Cotton Grower	Tennessee Chem. Co., Nashville, Tenn.	Fuller Bros., Dresden, Tenn.	10.00	1.65	1.00	16.45	10.53	1.46	1.56	17.00	Good
2559	Tobacco Grower	Louisville Fert. Co., Louisville, Ky.	J. B. Barber, Dresden, Tenn.	8.00	2.47	10.00	26.15	8.10	2.29	5.25	20.90	Good
2560	Forked Deer Early Vege- table Producer	Tennessee Cotton Oil Co., Jackson, Tenn.	Watson & Watson, Huntingdon, Tenn.	8.00	3.29	4.00	22.85	8.40	2.96	3.89	22.11	Good
2561	Special Cotton Grower...	National Fert. Co., Nashville, Tenn.	M. A. McCollum, Huntingdon, Tenn.	10.00	.82	3.00	15.70	13.17	.42	2.62	17.18	Good
2562	Rock City Guano	National Fert. Co., Nashville, Tenn.	M. A. McCollum, Huntingdon, Tenn.	8.00	1.65	2.00	15.45	7.95	1.25	2.63	14.70	Good
2564	Triangle Blood & Bone..	Interstate Phosphate Co., Nashville, Tenn.	A. E. Wall, Huntingdon, Tenn.	10.00	.83	1.00	13.70	10.54	1.04	1.28	15.35	Good
2565	Triangle Fish Cotton Guano	Interstate Phosphate Co., Nashville, Tenn.	A. E. Wall, Huntingdon, Tenn.	8.00	1.65	2.00	15.45	10.38	1.74	2.24	18.38	Good

OFFICIAL ANALYSES FOR 1912—COMPLETE FERTILIZERS—Continued.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phos-	Nitrogen	Potash	Commercial Value	Available Phos-	Nitrogen	Potash	Commercial Value	
2566	Triangle Special Guano..	Interstate Phosphate Co., Nashville, Tenn.	A. E. Wall, Huntingdon, Tenn.	10.00	1.65	1.00	16.45	13.08	1.54	2.42	19.58	Good
2567	Read's Matchless Grain Grower	Read Phosphate Co., Nashville, Tenn.	W. E. Gatlen, Buchanan, Tenn.	8.00	1.65	1.00	15.45	9.97	3.34	3.47	24.46	Good
2568	Old Hickory Special Tobacco Grower	National Fert. Co., Nashville, Tenn.	W. E. Gatlen, Puryear, Tenn.	10.00	1.65	10.00	25.45	12.42	1.68	12.12	30.08	Good
2569	Acid Phosphate & Potash	National Fert. Co., Nashville, Tenn.	W. E. Gatlen, Buchanan, Tenn.	10.00	.....	2.00	12.00	10.80	.09	3.74	14.84	Good
2570	B. S. Blood Bone & Potash	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Littleton & Bumpass, Puryear, Tenn.	9.00	.82	7.00	17.70	11.95	1.05	6.86	22.27	Good
2572	Special 10 per cent Potash Mixture	Hirsh Stein & Co., Chicago, Ill.	J. L. Moore, Camden, Tenn.	5.00	.82	10.00	17.76	5.76	.91	10.80	18.56	Good
2573	Calumet Brand Potash & Phosphate	Hirsh Stein & Co., Chicago, Ill.	J. L. Moore, Camden, Tenn.	10.00	.....	2.00	12.00	11.80	.17	2.34	14.70	Good
2574	Wheat, Corn & Oats Special	Hirsh Stein & Co., Chicago, Ill.	J. L. Moore, Camden, Tenn.	8.00	.80	4.00	14.64	10.27	.90	3.98	18.22	Good
2575	Calumet Brand Banner Cotton Grower	Hirsh Stein & Co., Chicago, Ill.	J. L. Moore, Camden, Tenn.	10.00	1.65	2.00	17.45	11.64	1.75	2.55	19.96	Good
2576	Calumet Brand Tennessee Cotton Grower ...	Hirsh Stein & Co., Chicago, Ill.	J. L. Moore, Camden, Tenn.	8.00	.82	2.00	12.70	9.96	1.04	2.37	15.76	Good
2577	Read's Corn Grower Special	Read Phosphate Co., Nashville, Tenn.	Boles Phosphate Co., Camden, Tenn.	10.00	.82	1.00	13.70	11.69	.58	1.88	15.48	Good

2578	Forked Deer Blood, Bone & Potash	Tennessee Cotton Oil Co., Jackson, Tenn.	P. W. Moore, Luray, Tenn.	8.00	1.65	2.00	15.45	8.27	1.78	2.15	16.27	Good
2579	Early Riser	Tennessee Cotton Oil Co., Jackson, Tenn.	P. W. Moore, Luray, Tenn.	10.00	1.65	2.00	17.45	10.08	2.06	2.00	18.87	Good
2581	Black Patch Tobacco Grower	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Lewis & Moss, Martin, Tenn.	8.00	.82	4.00	14.70	8.47	1.12	4.15	16.32	Good
2583	Black Patch Grain & Seed	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	J. W. Poole, Henderson, Tenn.	10.00	1.65	2.00	17.45	11.92	1.75	2.43	20.12	Good
2584	Farmer's Friend	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	J. W. Poole, Henderson, Tenn.	10.00	.82	2.00	14.70	11.74	1.07	3.17	18.44	Good
2585	H. G. Acid Phosphate ...	Federal Chemical Co., Nashville, Tenn.	A. M. & J. A. Cook, Stantonville, Tenn.	16.00	.....	.....	16.00	17.87	.12	.26	18.53	Good
2587	Superior Corn & Cotton Grower	Great Southern Phos. Co., Mt. Pleasant, Tenn.	W. T. Pafford, Big Sandy, Tenn.	10.00	.82	1.00	13.70	9.33	.92	1.46	13.88	Good
2588	Farmer's Champion	Great Southern Phos. Co., Mt. Pleasant, Tenn.	W. T. Pafford, Big Sandy, Tenn.	10.00	1.65	2.00	17.45	12.65	1.39	1.93	19.16	Good
2589	Empire Cotton Corn Grower	Empire Carbon Works, National Stock Yards, Ill.	A. N. Frazier, Big Sandy, Tenn.	8.00	1.65	2.00	15.45	10.05	1.66	1.96	17.48	Good
2590	Gen. Lee Cotton Grower ..	Great Southern Phos. Co., Mt. Pleasant, Tenn.	W. T. Pafford, Big Sandy, Tenn.	11.00	1.65	1.00	17.45	10.31	1.46	1.70	16.52	Good
2592	G. S. Wheat Grower	Great Southern Phos. Co., Mt. Pleasant, Tenn.	C. M. Dees, Henderson, Tenn.	8.00	1.65	2.00	15.45	10.35	1.60	1.71	17.34	Good
2595	Eagle Corn & Wheat Grower	Globe Fert. Co., Nashville, Tenn.	J. C. Peterson, Lexington, Tenn.	8.00	1.65	2.00	15.45	9.64	1.94	2.27	18.31	Good
2596	Globe Bone & Potash ...	Globe Fert. Co., Nashville, Tenn.	J. C. Peterson, Lexington, Tenn.	11.00	.41	1.00	13.35	13.01	.79	.58	16.19	Good
2597	Forked Deer Gold Bond.	Tennessee Cotton Oil Co., Jackson, Tenn.	W. T. Smith, Crump's Landing, Tenn.	8.00	1.65	2.00	15.46	8.51	1.54	2.23	15.88	Good
2598	F. D. H. G.	Tennessee Cotton Oil Co., Jackson, Tenn.	W. T. Smith, Crump's Landing, Tenn.	10.00	1.65	2.00	17.45	11.23	1.53	2.09	18.37	Good
2602	Forked Deer Grain Elevator	Tennessee Cotton Oil Co., Jackson, Tenn.	T. P. Spence, Ledbetter Landing, Tenn. ..	10.00	.82	1.00	13.70	11.38	.85	1.20	15.38	Good

OFFICIAL ANALYSES FOR 1912—COMPLETE FERTILIZERS—Continued.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phos-	Nitrogen	Potash	Commercial Value	Available Phos-	Nitrogen	Potash	Commercial Value	
2603	E. P. Best by Test	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Claude Bushart, Routon, Tenn.	12.00	1.65	2.00	19.45	15.02	1.55	3.64	23.77	Good
2606	Big Success Wheat & Corn Special	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Isaac Smith, Parsons, Tenn.	10.00	1.65	2.00	17.45	11.83	1.92	2.65	20.83	Good
2608	Cotton Belt H. G. Fert..	Tupelo Fert. Co., Tupelo, Miss.	Isaac Smith, Parsons, Tenn.	8.00	1.65	2.00	15.45	9.83	1.76	2.49	18.12	Good
2610	Scott's State Standard Guano	Va.-Carolina Chem. Co., Memphis, Tenn.	Brown Bros., Lexington, Tenn.	8.35	1.65	.....	15.80	10.00	1.59	2.17	17.42	Good
2611	Standard Cotton Hustler.	Southern Cotton Oil Co., Memphis, Tenn.	W. J. Hall, Jackson, Tenn.	8.35	1.65	2.00	15.80	10.46	1.46	2.00	17.27	Good
2612	Braden's Formula	Globe Fert. Co., Nashville, Tenn.	W. J. Hall, Jackson, Tenn.	11.00	.82	3.00	16.70	13.35	1.08	3.10	20.01	Good
2616	Favorite Cotton Grower.	Read Phosphate Co., Nashville, Tenn.	C. F. Drewry, Pocahontas, Tenn.	10.00	1.65	2.00	17.45	11.58	1.67	2.25	19.34	Good
2617	Ox Brand H. G. Animal Bone	Tennessee Chemical Co., Nashville, Tenn.	J. H. Cornelius, Middleton, Tenn.	10.00	1.65	2.00	17.45	11.85	1.56	1.98	18.96	Good
2618	Ox Boll Producer	Tennessee Chemical Co., Nashville, Tenn.	E. E. Adams & W. E. Blowe, McLemoresville, Tenn.	11.00	1.65	2.00	18.45	13.52	1.59	2.08	20.84	Good
2619	Ox Special Wheat & Corn Guano	Tennessee Chemical Co., Nashville, Tenn.	E. E. Adams & W. E. Blowe, McLemoresville, Tenn.	12.00	.82	1.00	15.70	14.83	1.52	1.40	21.24	Good
2620	Ox Brand Cotton Guano.	Tennessee Chemical Co., Nashville, Tenn.	G. N. Albright, Stanton, Tenn.	10.00	1.65	2.00	17.45	12.14	2.34	1.60	21.46	Good

2631	Royal H. G. Guano	Va.-Carolina Chem. Co., Memphis, Tenn.	W. L. Yancey, Trezevant, Tenn.	10.00	1.65	2.00	17.45	12.42	1.65	1.61	19.50	Good
2632	H. G. Cotton Belt Fert. ..	Tupelo Fert. Co., Tupelo, Miss.	H. J. Climer, Greenfield, Tenn.	8.00	2.47	4.00	20.15	12.48	3.15	4.20	27.07	Good
2625	N. W. Horseshoe Tobacco Grower	American Ag. Chem. Co., Cincinnati, Ohio	H. J. Climer, Greenfield, Tenn.	8.00	2.47	6.00	22.15	9.63	2.49	6.92	24.84	Good
2626	N. W. West Tenn. Special Vegetable Grower	American Ag. Chem. Co., Cincinnati, Ohio	H. J. Climer, Greenfield, Tenn.	8.00	1.65	2.00	15.45	9.65	2.01	2.02	18.30	Good
2628	H. G. Vegetable Grower ..	National Fert. Co., Nashville, Tenn.	Jas. Bryant, Milan, Tenn.	10.00	3.30	4.00	24.89	10.03	2.66	4.97	23.77	Good
2633	Hiawassee	Hiawassee Guano Co., Atlanta, Ga.	Farmers' Union Co., Jonesboro, Tenn.	10.00	3.30	4.00	24.89	10.11	3.30	4.09	25.09	Good
2634	Hiawassee	Hiawassee Guano Co., Atlanta, Ga.	Farmers' Union Co., Jonesboro, Tenn.	8.00	1.65	2.00	15.45	8.39	1.63	2.45	16.19	Good
2637	Furman's Ev. Aid.	Furman's Fert. & Imp. Co., Atlanta, Ga.	W. P. Diehl, Jonesboro, Tenn.	10.00	3.30	4.00	24.89	9.91	3.67	4.01	26.03	Good
2640	H. G. Special	Read Phosphate Co., Nashville, Tenn.	Bonds-Baring Hdw. Co., Elizabethton, Tenn. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2641	N. W. Horseshoe Brand.	American Ag. Chem. Co., Cincinnati, Ohio.	Geo. Rosel, Cleveland, Tenn.	8.00	2.47	6.00	22.15	7.90	2.40	5.86	21.58	Good
2642	Complete Fert.	Edward Schultze, Chattanooga, Tenn.	M. L. Beard, Cleveland, Tenn.	8.00	1.65	2.00	15.45	10.70	1.39	2.39	17.68	Good
2643	Adair's Soluble Pacific Guano	Adair & McCarty Bros., Chattanooga, Tenn.	M. L. Beard, Cleveland, Tenn.	10.00	1.65	2.00	17.45	10.78	1.74	2.18	18.70	Good
2644	Adair's Blood & Tankage	Adair & McCarty Bros., Chattanooga, Tenn.	Bayless Hdw. Co., Athens, Tenn.	9.00	.82	2.00	13.70	9.64	1.04	2.10	15.77	Good
2645	McCarty's Wheat Special	Adair & McCarty Bros., Chattanooga, Tenn.	Bayless Hdw. Co., Athens, Tenn.	10.00	.82	3.00	15.76	10.83	1.15	5.10	17.71	Good
2654	Southern Fert. Co. Tenn. Special Wheat	Va.-Carolina Chem. Co., Atlanta, Ga.	W. J. Barton Imp. & Seed Co., Johnson City, Tenn.	10.00	.....	4.00	14.00	11.93	.44	3.38	16.70	Good
2493	Ox Brand Blood Guano ..	Tennessee Chemical Co., Nashville, Tenn.	W. R. Craig & Son, Pulaski, Tenn.	10.00	.82	2.00	14.70	10.33	.95	1.99	16.32	Good

OFFICIAL ANALYSES FOR 1912—COMPLETE FERTILIZERS—Continued.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phos-	Nitrogen	Potash	Commercial Value	Available Phos-	Nitrogen	Potash	Commercial Value	
2349	Adair High Grade Dissolved Bone	A. D. Adair & McCarty Bros., Chattanooga, Tenn.	Baldwin Feed & Impl. Co., Johnson City, Tenn.	16.00	.....	.....	\$16.00	17.22	.....	.....	\$17.22	Good
2351	Ground Phosphate Rock & Bone Phosphate	Va.-Carolina Chemical Co., Richmond, Va.	W. J. Barton Imp. & Feed & Seed Co., Johnson City, Tenn.	65.00	.....	.....	6 to 8	18.15	.....	.....	18.15	Good
2352	High Grade Acid Phosphate	Va.-Carolina Chemical Co., Richmond, Va.	W. J. Barton Imp. & Feed & Seed Co., Johnson City, Tenn.	16.00	.....	.....	16.00	18.74	.....	.....	18.74	Good
2356	Armour's Acid Phosphate	Armour's Fert. Works, Nashville, Tenn.	Jas. A. Boyd, Jonesboro, Tenn.	16.00	.....	.....	16.00	17.49	.....	.....	17.49	Good
2360	Armour's Star Phosphate	Armour's Fert. Works, Nashville, Tenn.	Jas. A. Boyd, Jonesboro, Tenn.	14.00	.....	.....	14.00	15.39	.....	.....	15.39	Good
2363	Extra Rome High Grade Dissolved Bone	Rome Chemical Co., Atlanta, Ga.	W. P. Diehl, Jonesboro, Tenn.	16.00	.....	.....	16.00	17.71	.....	.....	17.71	Good
2364	Rome High Grade Dissolved Bone	Rome Chemical Co., Atlanta, Ga.	W. P. Diehl, Jonesboro, Tenn.	14.00	.....	.....	14.00	16.45	.....	.....	16.45	Good
2367	Read's High Grade Acid Phosphate	Read Phosphate Co., Nashville, Tenn.	J. M. Ward, Jonesboro, Tenn.	14.00	.....	.....	14.00	16.06	.....	.....	16.06	Good
2372	Baugh's 16 Acid Phosphate	Baugh & Sons, Philadelphia, Pa.	J. M. Ward, Jonesboro, Tenn.	16.00	.....	.....	16.00	16.52	.....	.....	16.52	Good
2379	Furman's Dissolved Bone	Furman's Farm Imp. Co., Atlanta, Ga.	H. L. Milligan, Greeneville, Tenn.	12.00	.....	.....	12.00	14.09	.....	.....	14.09	Good
2386	Daybreak Standard Phosphate	Federal Chemical Co., Louisville, Ky.	M. S. Roberts & Son, Greeneville, Tenn.	12.00	.....	.....	12.00	14.53	.....	.....	14.53	Good

2392	Read's Special High Grade Phosphate	Read Phosphate Co., Nashville, Tenn.	The Beck-Tarver Co., Knoxville, Tenn.	16.00	.....	16.00	17.02	.....	17.02	Good
2404	High Grade Acid Phosphate	Lowe-Ford Hdwr. Co., Knoxville, Tenn.	Lowe-Ford Hdwr. Co., Knoxville, Tenn.	16.00	.....	16.00	17.98	.....	17.98	Good
2409	Furman's High Grade No. 16 Dissolved Bone	Furman's Farm Imp. Co., Atlanta, Ga.	E. W. Gillespie, Knoxville, Tenn.	16.00	.....	16.00	16.64	.....	16.64	Good
2411	Pioneer Digested Bone	Pioneer Fert. Co., Florence, Ala.	Wright Hdwr. Co., Knoxville, Tenn.	14.00	.....	14.00	14.91	.....	14.91	Good
2415	Pioneer High Grade Acid Phosphate	Pioneer Fert. Co., Florence, Ala.	Wright Hdwr. Co., Knoxville, Tenn.	16.00	.....	16.00	15.97	.....	15.97	Good
2420	Globe High Grade Acid Phosphate	Globe Fert. Co., Louisville, Ky.	Market Hdwr. & Harness Co., Knoxville, Tenn.	16.00	.....	16.00	18.38	.....	18.38	Good
2495	Big Success H. G. Dissolved Bone	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	J. Luttrell, Loretta, Tenn.	16.00	.....	16.00	17.53	.....	17.53	Good
2497	Black Patch Mt. Pleasant Sol. Bone	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	J. Luttrell, Loretta, Tenn.	12.00	.....	12.00	13.73	.....	13.37	Good
2498	Big Success Mt. Pleasant Special Acid Phosphate	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	J. Luttrell, Loretta, Tenn.	14.00	.....	14.00	16.24	.....	16.24	Good
2478	Fox Brand H. G. Acid Phosphate	Fox Chemical Co., Louisville, Ky.	Dan T. Smart, McMinnville, Tenn.	16.00	.....	16.00	17.80	.....	17.80	Good
2483	Ox Brand Acid Phosphate	Tennessee Chemical Co., Nashville, Tenn.	Biles-Smith Hdwr. Co., McMinnville, Tenn.	12.00	.....	12.00	13.56	.24	13.80	Good
2484	Ox Brand Acid Phosphate	Tennessee Chemical Co., Nashville, Tenn.	Biles-Smith Hdwr. Co., McMinnville, Tenn.	14.00	.....	14.00	13.38	.05	13.89	Good
2501	Furman's H. G. Dissolved Bone	Furman's Farm Imp. Co., Atlanta, Ga.	M. H. Wheathers, Loretta, Tenn.	14.00	.....	14.00	13.61	.....	13.61	Good
2503	Alabama Standard Dissolved Bone	Leoma Union Whse. & Mfg. Co., Leoma, Tenn.	R. B. Ayers, Loretta, Tenn.	14.00	.....	14.00	16.29	.....	16.29	Good
2504	Woods H. G. Dissolved Bone	Leoma Union Whse. & Mfg. Co., Leoma, Tenn.	R. B. Ayers, Loretta, Tenn.	16.00	.....	16.00	16.75	.....	16.75	Good
2513	Chickamauga H. G. Dissolved Bone	Chickamauga Fert. Works, Chattanooga, Tenn.	H. Koelsch, Loretta, Tenn.	14.00	.....	14.00	14.61	.....	14.61	Good

OFFICIAL ANALYSES FOR 1912—COMPLETE FERTILIZERS—Continued.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phos-	Nitrogen	Potash	Commercial Value	Available Phos-	Nitrogen	Potash	Commercial Value	
2514	Chickamauga Dissolved Bone	Chickamauga Fert. Works, Chattanooga, Tenn.	H. Koelsch, Loretta, Tenn.	12.00	.....	.....	12.00	12.56	.....	.....	12.56	Good
2529	Globe Standard Acid Phosphate	Globe Fert. Co., Nashville, Tenn.	R. F. Lewis, Adamsville, Tenn.	12.00	.....	.....	12.00	13.76	.....	.....	13.76	Good
2540	Triangle Bone Phosphate	Interstate Phos. Co., Nashville, Tenn.	W. A. Presson, Camden, Tenn.	14.00	.....	.....	14.00	16.71	.....	.....	16.71	Good
2554	Globe Acid Phosphate...	Globe Fertilizer Co., Nashville, Tenn.	Jas. L. Morgan, Gibson, Tenn.	14.00	.....	.....	14.00	17.82	.....	.....	17.82	Good
2591	Great Southern Acid Phosphate	Great Southern Acid Phos. Co., Mt. Pleasant, Tenn.	W. T. Pafford, Big Sandy, Tenn.	16.00	.....	.....	16.00	17.36	.....	.....	17.36	Good
2609	Cotton Belt H. G. Acid Phosphate	Tupelo Fert. Co., Tupelo, Miss.	Isaac L. Smith, Parsons, Tenn.	16.00	.....	.....	16.00	17.80	.....	.20	18.00	Good
2601	Extra H. G. Acid Phosphate	Tennessee Cotton Oil Co., Jackson, Tenn.	W. T. Smith, Crump's Landing, Tenn.	16.00	.....	.....	16.00	14.95	.....	.....	14.95	Good
2629	Hiwassee	Hiwassee Guano Co., Atlanta, Ga.	Farmers' Union Co., Jonesboro, Tenn.	14.00	.....	.....	14.00	15.12	.....	.....	15.12	Good
2630	Hiwassee	Hiwassee Guano Co., Atlanta, Ga.	Farmers' Union Co., Jonesboro, Tenn.	16.00	.....	.....	16.00	15.99	.....	.....	15.99	Good
2632	Eagle	Louisville Fert. Co., Louisville, Ky.	Farmers' Union Co., Jonesboro, Tenn.	14.00	.....	.....	14.00	15.65	.....	.....	15.65	Good
2635	Bear Brand	Continental Fertilizer Co., Nashville, Tenn.	W. P. Diehl, Jonesboro, Tenn.	14.00	.....	.....	14.00	13.34	.....	.....	13.34	Good

2636	Swift's	Swift's Fert. Co., Atlanta, Ga.	W. P. Diehl, Jonesboro, Tenn.	16.00	16.00	16.71	16.71	16.71	Good
2638	Lion	Marietta Fert. Co., Atlanta, Ga.	W. P. Diehl, Jonesboro, Tenn.	14.00	14.00	14.89	14.89	14.89	Good
2639	Swift's Cultivator	Swift's Fert. Co., Atlanta, Ga.	W. P. Diehl, Jonesboro, Tenn.	14.00	14.00	13.73	13.73	13.73	Good
2646	Adair's Dissolved Bone	Adair & McCarty Bros., Chattanooga, Tenn.	Bayless Hdw. Co., Athens, Tenn.	14.00	14.00	14.26	14.26	14.26	Good
2649	Acid Phosphate	National Fert. Co., Nashville, Tenn.	Byrd Bros., Greeneville, Tenn.	12.00	12.00	13.67	13.67	13.67	Good
2653					48.00	50.20	50.20	50.20	Good
2660	Muriate of Potash	Tennessee Cotton Oil Co., Jackson, Tenn.	W. T. Smith, Crump's Landing, Tenn.		50.00	51.34	51.34	51.34	Good
2613	Sulphate of Potash	Tennessee Chemical Co., Nashville, Tenn.	Hicks-Lawrence Corn Co., Jackson, Tenn.		48.00	48.98	48.98	48.98	Good
2622	Kainit	Tupelo Fert. Co., Tupelo, Miss.	J. O. Steele, Selmer, Tenn.		12.00	12.19	12.19	12.68	Good
2635	Muriate of Potash	Tupelo Fert. Co., Tupelo, Miss.	Will Hockaday, Selmer, Tenn.		48.00	48.96	48.96	48.96	Good
2541	Pure German Kainit	Va.-Carolina Chem. Co., Memphis, Tenn.	M. F. Hamilton, Humboldt, Tenn.		12.00	14.74	14.74	14.74	Good
2652	German-Caney	Coveta Fert. Co., Newman, Ga.	Byrd Bros., Greeneville, Tenn.		12.00	12.68	12.68	12.68	Good
2686	Kainit	Federal Chemical Co., Nashville, Tenn.	A. M. & J. A. Cooke, Stantonville, Tenn.		12.00	20.98	20.98	20.98	Good
2390	Muriate of Potash	Read Phosphate Co., Nashville, Tenn.	The Beck Tarver Co., Knoxville, Tenn.		50.00	50.60	50.60	50.60	Good
2354	Nitrate of Soda	Rome Chemical Co., Atlanta, Ga.	W. J. Barton Impl. Fac. & Sad- dle Co., Johnson City, Tenn.	14.85	49.00	14.92	14.92	49.20	Good
2428	Nitrate of Soda	Va.-Carolina Chemical Co., Memphis, Tenn.	M. F. Hamilton, Humboldt, Tenn.	14.85	49.00	15.22	15.22	50.26	Good
2436	Nitrate of Soda	The A. H. George Co., Meridian, Miss.	Clement Bros., Humboldt, Tenn.	15.00	49.50	9.76	9.76	32.62	Good

OFFICIAL ANALYSES FOR: 1912—COMPLETE FERTILIZERS—Continued.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phos-	Nitrogen	Potash	Commercial Value	Available Phos-	Nitrogen	Potash	Commercial Value	
2451	Homestead Raw Bone	American Agricultural Chem. Co., Cincinnati, Ohio	L. F. Bell & Co., Springfield, Tenn.	.....	3.29	.....	10.85	.....	4.05	.....	13.36	Good
2462	Raw Bone	Fox Chemical Co., Louisville, Ky.	J. A. Long & Co., Springfield, Tenn.	.....	3.00	.....	10.10	.....	3.86	.....	12.74	Good
2468	Read's Pure Raw Bone Meal	Read Phosphate Co., Nashville, Tenn.	H. G. Banks, Springfield, Tenn.	.....	3.70	.....	12.21	.....	4.14	.....	13.66	Good
2580	Nitrate of Soda	Globe Fert. Co., Nashville, Tenn.	Jas. L. Morgan, Gibson, Tenn.	.....	15.00	.....	49.50	.....	13.25	.....	50.32	Good
2582	Nitrate of Soda	Empire Carbon Works, National Stock Yards, Ill.	D. J. Craddock, Humboldt, Tenn.	.....	15.00	.....	49.50	.....	15.22	.....	50.22	Good
2594	Nitrate of Soda	Great Southern Phos. Co., Mt. Pleasant, Tenn.	C. M. Dees, Henderson, Tenn.	.....	15.00	.....	49.50	.....	15.00	.....	49.00	Good
2605	Nitrate of Soda	National Fertilizer Co., Nashville, Tenn.	J. T. Warmath, Gibson, Tenn.	.....	15.00	.....	49.50	.....	14.82	.....	48.90	Good
2615	Bone Meal	Tennessee Chemical Co., Nashville, Tenn.	Hicks-Lawrence Corn Co., Jackson, Tenn.	.....	2.46	.....	13.26	14.29	2.52	.....	22.60	Good
2615	Nitrate of Soda	Tennessee Chemical Co., Nashville, Tenn.	Hicks-Lawrence Corn Co., Jackson, Tenn.	.....	14.81	.....	46.87	.....	15.42	.....	50.88	Good
2599	Nitrate of Soda	Tennessee Cotton Oil Co., Jackson, Tenn.	W. T. Smith, Crump's Landing, Tenn.	.....	15.00	.....	49.50	.....	15.24	.....	50.29	Good
2347	Adair's Wheat & Corn Grower	Adair & McCarty Bros., Chattanooga, Tenn.	Baldwin Feed & Impl. Co., Johnson City, Tenn.	10.00	.....	4.00	14.00	10.62	.....	4.36	14.98	Good

2348	Adair's Formula	Adair & McCarty Bros., Chattanooga, Tenn.	10.00	2.30	12.30	12.48	2.21	14.69	Good
2357	Armour's Phosphate & Potash	Armour's Fert. Works, Nashville, Tenn.	10.00	4.00	14.00	11.06	3.72	14.78	Good
2362	Rome H. G. 10-4 & Pot- ash	Rome Chemical Co., Atlanta, Ga.	10.00	4.00	14.00	12.50	4.25	16.75	Good
2366	Rome H. G. 8 & 4 Bone & Potash	Rome Chemical Co., Atlanta, Ga.	8.00	4.00	12.00	10.14	4.15	14.29	Good
2368	Read's Acid Phosphate with Potash	Read Phosphate Co., Nashville, Tenn.	8.00	4.00	12.00	8.70	3.76	12.46	Good
2369	Daybreak Potash Com- pound	Federal Chemical Co., Louisville, Ky.	8.00	4.00	12.00	9.22	4.38	13.60	Good
2373	Special Bone & Potash Compound	The J. R. Young Fert. Co., Norfolk, Va.	8.00	4.00	12.00	8.49	4.21	12.70	Good
2376	Armour's 8-4	Armour's Fert. Works, Nashville, Tenn.	8.00	4.00	12.00	9.82	4.59	14.41	Good
2377	Furman's Potash Special	Furman's Farm Imp. Co., Atlanta, Ga.	8.00	4.00	12.00	8.75	3.68	12.43	Good
2378	Furman's Farish Formula	Furman's Farm Imp. Co., Atlanta, Ga.	10.00	2.00	12.00	10.60	2.06	12.66	Good
2383	Daybreak Potash Com- pound	Federal Chemical Co., Louisville, Ky.	8.00	4.00	12.00	8.95	3.74	12.69	Good
2388	Read's H. G. Special Pot- ash Mixture	Read Phosphate Co., Nashville, Tenn.	10.00	4.00	14.00	10.39	4.36	14.75	Good
2391	Ox Potash Mixture	Tennessee Chemical Co., Nashville, Tenn.	10.00	2.00	12.00	9.78	2.23	12.00	Good
2403	Armour's Phosphate & Potash	Armour's Fert. Works, Nashville, Tenn.	10.00	2.00	12.00	10.27	2.12	12.39	Good
2412	Chickamauga Wheat & Corn Grower	Chickamauga Fert. Works, Chattanooga, Tenn.	10.00	4.00	14.00	11.15	2.85	14.00	Good
2416	Pioneer Guano	Pioneer Fert. Co., Florence, Ala.	10.00	2.00	12.00	12.83	2.25	15.18	Good

OFFICIAL ANALYSES FOR 1912—COMPLETE FERTILIZERS—Continued.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phos-phoric Acid	Nitrogen	Potash	Commercial Value	Available Phos-phoric Acid	Nitrogen	Potash	Commercial Value	
2421	Adair's Wheat & Corn Grower	Adair & McCarty Bros., Chattanooga, Tenn.	Baldwin Feed & Impl. Co., Johnson City, Tenn.	10.00	.....	4.00	14.00	12.10	.....	2.94	15.04	Good
2461	Half & Half Bone Meal Mixture	Fox Chemical Co., Louisville, Ky.	J. A. Long & Co., Springfield, Tenn. ....	.....	.....	.....	.....	.....	.....	.....	.....	.....
2473	Ox Brand Alkaline Bone.	Tennessee Chemical Co., Nashville, Tenn.	Everett Hdw. Co., Sparta, Tenn.	12.00	.....	2.00	14.00	13.29	.....	2.12	15.41	Good
2475	Forked Deer Fert. Phos. Acid & Potash	Tennessee Cotton Oil Co., Jackson, Tenn.	S. G. Hicks, Sparta, Tenn.	10.00	.....	2.00	12.00	10.98	.....	2.12	13.10	Good
2476	Forked Deer Fert. Phos. Acid & Potash	Tennessee Cotton Oil Co., Jackson, Tenn.	S. G. Hicks, Sparta, Tenn.	10.00	.....	4.00	14.00	11.34	.....	3.57	14.91	Good
2477	Tiger Potash Guano	Tennessee Valley Fert. Co., Florence, Ala.	Dan T. Smart, McMinnville, Tenn.	10.00	.....	4.00	14.00	9.88	.....	3.29	12.17	Good
2482	Fox Brand Bone Phosphate & Potash	Fox Chemical Co., Louisville, Ky.	Dan T. Smart, McMinnville, Tenn.	10.00	.....	4.00	14.00	12.21	.....	.....	12.21	Good
2486	Read's Alkaline Bone ...	Read Phosphate Co., Nashville, Tenn.	Henegar & Martin, McMinnville, Tenn.	10.00	.....	2.00	12.00	10.20	.....	1.98	12.18	Good
2487	Read's Potash Mixture...	Read Phosphate Co., Nashville, Tenn.	Henegar & Martin, McMinnville, Tenn.	10.00	.....	4.00	14.00	6.15	.08	4.48	10.89	Good
2489	Read's H. G. Acid Phosphate	Read Phosphate Co., Nashville, Tenn.	Henegar & Martin, McMinnville, Tenn.	16.00	.....	.....	16.00	17.48	.....	.40	17.88	Good
2505	Furman's Bone & Potash	Furman's Farm Imp. Co., Atlanta, Ga.	M. H. Weathers, Loretta, Tenn.	10.00	.....	4.00	14.00	10.91	.....	4.00	14.91	Good

2507	Corn & Wheat Special...	Leoma Union Whse. & Mfg. Co., Leoma, Tenn.	W. J. Wright, Loretta, Tenn.	10.00	4.00	14.00	9.89	5.48	15.31	Good	
2508	Sim's Formula	Leoma Union Whse. & Mfg. Co., Leoma, Tenn.	W. J. Wright, Loretta, Tenn.	12.00	2.00	14.00	12.97	2.61	15.58	Good	
2509	Ashcraft's Formula	Tennessee Valley Fert. Co., Florence, Ala.	A. E. Hollander, Loretta, Tenn.	10.47	2.19	12.66	10.41	3.15	13.56	Good	
2515	Globe Bone Phosphate & Potash	Globe Fert. Co., Louisville, Ky.	Augustin Bros. & Co., Loretta, Tenn.	10.00	4.00	14.00	11.05	4.10	15.15	Good	
2516	Globe Potash Special ...	Globe Fert. Co., Louisville, Ky.	Augustin Bros. & Co., Loretta, Tenn.	10.00	2.00	12.00	11.31	2.22	13.53	Good	
2523	Horseshoe Brand Bone & Potash	American Agro. Chem. Co., Cincinnati, Ohio	W. G. Adams, Paris, Tenn.	10.00	2.00	12.00	12.27	2.08	14.25	Good	
2528	Globe Potash Formula..	Globe Fert. Co., Nashville, Tenn.	R. F. Lewis, Adamsville, Tenn.	9.00	5.00	14.00	12.46	5.28	17.74	Good	
2544	Mule Brand Acid Phos- phate & Potash	American Guano Co., Nashville, Tenn.	Hare & Wall, Yuma, Tenn.	10.00	4.00	14.00	10.32	5.42	16.43	Good	
2551	Triangle Bone & Potash	Interstate Phosphate Co., Nashville, Tenn.	J. W. Jarrett, West Port, Tenn.	10.00	4.00	14.00	11.96	5.37	17.33	Good	
2552	Eagle Potash Mixture ...	Louisville Fert. Co., Louisville, Ky.	J. A. Joyner, West Port, Tenn.	10.00	2.00	12.00	10.24	2.36	12.60	Good	
2558	Bone Meal	Louisville Fert. Co., Louisville, Ky.	J. B. Borher, Dresden, Tenn.	12.00	24.75	26.16	19.55	2.12	26.55	Good	
2563	Potash Mixture	Louisville Fert. Co., Louisville, Ky.	A. Joyner, Huntingdon, Tenn.	10.00	2.00	12.00	11.21	2.49	15.70	Good	
2571	Banner Grain Grower ...	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Littleton & Bumpass, Puryear, Tenn.	10.00	2.00	12.00	12.41	2.80	15.21	Good	
2593	Ever Ready Wheat Grower	Great Southern Phos. Co., Mt. Pleasant, Tenn.	C. M. Deeds, Henderson, Tenn.	10.00	2.00	12.00	11.09	20	1.83	13.58	Good
2597	Corn & Wheat Special...	Leoma Union Whse. & Mfg. Co., Leoma, Tenn.	W. J. Wright, Loretta, Tenn.	10.00	4.00	14.00	9.89	5.41	15.30	Good	
2604	Black Patch Wheat Spe- cial	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Claude Bushart, Routen, Tenn.	10.00	4.00	14.00	10.74	3.22	16.24	Good	

OFFICIAL ANALYSES FOR 1912—COMPLETE FERTILIZERS—Continued.

Chemist's Number	BRAND OF FERTILIZER	NAME OF MANUFACTURER	MERCHANT OR AGENT SELLING SAME	Fertilizer Ingredients Claimed by Manufacturer				Fertilizing Ingredient Actually Found by State Chemist				Mechanical Condition
				Available Phos-	Potash	Commercial Value		Available Phos-	Nitrogen	Potash	Commercial Value	
2607	Cotton Belt Phosphate & Potash	Tupelo Fert. Co., Tupelo, Miss.	Isaac L. Smith, Parsons, Tenn.	10.00	4.00	14.00		11.61	.....	4.97	16.58	Good
2627	Phosphate & Potash	Tupelo Fert. Co., Tupelo, Miss.	H. J. Climer, Greenfield, Tenn.	10.00	4.00	14.00		12.26	.24	4.00	17.05	Good
2633	Hiwassee	Hiwassee Guano Co., Atlanta, Ga.	Farmers' Union Co., Jonesboro, Tenn.	8.00	4.00	12.00		7.83	.....	3.66	11.49	Good
2640	Read's H. G. Special	Read Phosphate Co., Nashville, Tenn.	Barnes-Baring Hdw. Co., Elizabethton, Tenn.	10.00	4.00	14.00		10.82	.....	3.53	14.25	Good
2647	Adair's Formula	Adair & McCarty, Chattanooga, Tenn.	Bayless Hdw. Co., Athens, Tenn.	10.00	2.00	12.00		10.40	.....	2.04	12.44	Good
2648	Adair's Special Potash Mixture	Adair & McCarty, Chattanooga, Tenn.	Bayless Hdw. Co., Athens, Tenn.	8.00	4.00	12.00		8.46	.....	4.22	12.68	Good
2650	Acid Phosphate & Potash	National Fert. Co., Nashville, Tenn.	Bird Bros., Greeneville, Tenn.	10.00	2.00	12.00		12.73	.....	1.94	14.67	Good
2651	Acid Phosphate	National Fert. Co., Nashville, Tenn.	Bird Bros., Greeneville, Tenn.	8.00	4.00	12.00		11.84	.....	4.32	16.16	Good
2653	Baldwin's Wheat & Grass Grower	Va.-Carolina Chemical Co., Atlanta, Ga.	W. J. Barton Impl. & Seed Co., Johnson City, Tenn.	10.00	2.00	12.00		10.71	.47	2.55	14.81	Good
2655	Coweta Wheat & Grass Grower	Cowetta Fert. Co., Newnan, Ga.	Merchants Exchange, Johnson City, Tenn.	10.00	2.00	12.00		10.37	.47	2.38	14.31	Good
2656	Coweta Wheat & Grass Grower	Cowetta Fert. Co., Newnan, Ga.	Merchants Exchange, Johnson City, Tenn.	10.00	4.00	14.00		11.20	.58	4.24	17.35	Good
2461	Half & Half Bone Meal Mixture	Fox Chemical Co., Louisville, Ky.	J. A. Long & Co., Springfield, Tenn.	12.00	1.65	17.45		12.25	2.07	.....	18.98	Good

TENNESSEE FERTILIZER LAW.

CHAPTER 417.—HOUSE BILL NO. 390.

A BILL to be entitled "An Act to regulate the registration, sale, inspection, and analysis of commercial fertilizers, acid phosphates, fertilizer material and chemicals in the State of Tennessee, and to consolidate all laws relating to said sales, inspection, and analysis, and to repeal all other laws or parts or laws in conflict therewith."

SECTION 1. *Be it enacted by the General Assembly of the State of Tennessee*, That all manufacturers, jobbers, and manipulators of commercial fertilizers, and fertilizer material to be used in the manufacture of the same, who may desire to sell or offer for sale in the State of Tennessee such commercial fertilizers and fertilizer materials, shall first file with the Commissioner of Agriculture of the State of Tennessee, upon forms furnished by said Commissioner, the name of each brand of commercial fertilizer, acid phosphate, fertilizer material or chemical which they may desire to sell in said State, either by themselves or their agents, together with the name and address of the manufacturer or manipulator, also the guaranteed analysis thereof, stating the sources from which the phosphoric acid, nitrogen and potash are derived; and if the same commercial fertilizer is sold under a different name or names, said facts shall be stated, and the different brands which are identical shall be named.

SEC. 2. All persons, companies, manufacturers, dealers, or agents, before selling or offering for sale in this State any commercial fertilizer or fertilizer material, shall brand or attach to each bag, barrel, or package the name and address of the manufacturer, and the guaranteed analysis of the commercial fertilizer, giving the valuable constituents of the commercial fertilizer in minimum percentages only. Only these items shall be branded, or printed, on the package in the following order:

1. Weight of each package in pounds.
2. Brand name or trade mark.
3. Guaranteed analysis.
4. Available phosphoric acid—per cent.
5. Nitrogen—per cent.
6. Potash—per cent.
7. Name and address of the manufacturer.

In the bone meal, tankage, or other products where the phosphoric acid is not available to laboratory methods, but becomes available on the decomposition of the product in the soil, the phosphoric acid shall be claimed as total phosphoric acid, unless it be desired to claim avail-

able phosphoric acid also, in which latter case the guarantee must take the form above set forth. In the case of bone meal and tankage, manufacturers may brand on these bags information showing the fineness of the product, provided it takes a form approved by the Commissioner of Agriculture.

SEC. 3. If any commercial fertilizer or fertilizer material offered for sale in the State shall, upon official analysis, prove deficient in any of its ingredients as guaranteed and branded upon the sacks or packages, and if by reason of such deficiency the commercial value thereof shall fall 3 per cent below the guaranteed total commercial value of such commercial fertilizer or fertilizer material, then any note or obligation given in payment thereof shall be collectable by law only for the amount of the actual total commercial value as ascertained by said official analysis. Whenever the Commissioner of Agriculture shall be satisfied that any commercial fertilizer is essentially below the guaranteed value in plant food, it shall be his duty to assess said deficiency against the manufacturer of the commercial fertilizer and require that the value of the deficiency be made good to all persons who, in the opinion of the Commissioner, have purchased the said low grade commercial fertilizer; and the Commissioner may seize any commercial fertilizer belonging to the said company, if the deficiency shall not be paid within thirty days after notice to the company. If the Commissioner shall be satisfied that the deficiency in plant food was due to the intention or fraud of the manufacturer, then the Commissioner shall assess and collect from the manufacturer twice the amount of the deficiency and pay over the same to the parties who purchased said commercial fertilizer; that if any manufacturer shall resist such collection or payment, the Commissioner shall immediately publish the analysis and the facts in the Bulletin and in such newspapers in the State as he may deem necessary.

SEC. 4. *Be it further enacted*, That the words "high grade" shall not appear upon any bag or other package of any complete commercial fertilizer, which complete fertilizer contains, by its guaranteed analysis, less than 10 per cent of available phosphoric acid, 1.65 per cent of nitrogen (equivalent to 2 per cent ammonia), and 2 per cent of potash, or a grade or analysis of equal total commercial value; that the word "standard" shall not appear upon any bag or other package of any complete commercial fertilizer which contains, by its guaranteed analysis, less than 8 per cent of available phosphoric acid, 1.65 per cent of nitrogen (equivalent to 2 per cent ammonia), and 2 per cent of potash, or a grade or analysis of equal total commercial value; that the words

"high grade" shall not appear upon any bag or other package of any acid phosphate with potash which shall contain, by its guaranteed analysis, less than 13 per cent of available phosphoric acid and 1 per cent of potash, or a grade or analysis of equal total commercial value; that the word "standard" shall not appear upon any bag or other package of any acid phosphate with potash which shall contain, by its guaranteed analysis, less than 11 per cent of available phosphoric acid and 1 per cent of potash, or a grade or analysis of equal total commercial value; that the words "high grade" shall not appear upon any bag or other package of any plain acid phosphate which shall contain, by its guaranteed analysis, less than 14 per cent of available phosphoric acid; and, lastly, that the word "standard" shall not appear upon any bag or other package of any plain acid phosphate which shall contain, by its guaranteed analysis, less than 12 per cent of available phosphoric acid.

It is further hereby provided that no complete fertilizer, acid phosphate with potash, acid phosphate with nitrogen, or plain acid phosphate, shall be offered for sale in this State which contains less than 12 per cent of total plant food, namely, available phosphoric acid; nitrogen, and potash, either singly or in combination; provided, that in mixed commercial fertilizers there shall not be claimed less than 1 per cent of potash and 0.32 per cent of nitrogen when one or both are present in the same mixture.

SEC. 5. *Be it further enacted*, That all manufacturers and manipulators, or agents representing them, who have registered their brands in compliance with Section 1 of this Act shall forward to the Commissioner of Agriculture a request for tax tags, stating that said tags are to be used upon brands of commercial fertilizers and fertilizer materials registered in accordance with this Act, and said request shall be accompanied with the sum of 50 cents per ton as an inspection fee; whereupon it shall be the duty of the Commissioner of Agriculture to issue tags to parties applying, who shall attach a tag to each bag, barrel, or package thereof, which, when attached to said package, shall be *prima facie* evidence that the seller has complied with the requirements of this Act. Any tags left in the possession of the manufacturers shall not be used for another season, but shall be redeemed with new tags within sixty days after the close of the Department's fiscal year, which fiscal year shall be comprised between the dates of June 1, inclusive. The color of said tags must be changed each fiscal year, and there shall not be printed upon said tags any brand name or analysis.

SEC. 6. *Be it further enacted*, That it shall not be lawful for any

manufacturer or company, either by themselves or their agents, to sell or offer for sale in this State any commercial fertilizer or fertilizer material that has not been registered with the Commissioner of Agriculture as required by this Act. The fact that the purchaser waives the inspection and analysis thereof shall be no protection to said party selling or offering the same for sale.

SEC. 7. The guaranteed analysis of each and every brand of commercial fertilizer or fertilizer material must, without exception, remain uniform throughout the fiscal year for which it is registered; and in no case, even at subsequent registration, shall the grade be lowered, although the proportion of available constituents may be changed so that the increase of one constituent may be compensated for in value by the increase of the other or others. Such proposed change must first receive the approval of the Commissioner of Agriculture.

A brand name or (and) trade-mark registered by one manufacturer shall not be entitled to registry by another, and the manufacturer having first registered and used the same brand name or (and) trade-mark shall be entitled to it, even should said brand name or (and) trade-mark not be offered for current registration at the time—nothing in this section to be construed as debarring the right of any manufacturer to establish his ownership in, and prior right of registration of, any brand name or (and) trade-mark, whether said brand name or (and) trademark had been previously registered or not.

SEC. 8. No person, company, dealer, or agent shall sell, expose, or offer for sale in this State, any pulverized leather—raw, steamed, roasted, or in any other form—either as a commercial fertilizer or fertilizer material, without first making full, explicit statement of the facts in registration with the Commissioner of Agriculture and furnishing satisfactory proof that the nitrogen is sufficiently available and valuable for the purpose for which it is sold.

SEC. 9. *Be it further enacted*, That the Commissioner of Agriculture shall appoint not to exceed three inspectors of commercial fertilizers, who shall hold their offices for such time as said Commissioner, in his judgment, shall think best for carrying on the provisions of this Act. The greatest compensation which any one inspector of commercial fertilizers shall receive shall be at the rate of \$83.33 per month and his actual expenses while in the discharge of his duty as such inspector. It shall be his duty to inspect all commercial fertilizers, acid phosphates, chemicals, cottonseed meal, or other fertilizing material that may be found at any point within the limits of the State, and to go to any point when so directed by the Commissioner of Agricul-

ture; and he shall see that all commercial fertilizers and fertilizer materials are properly tagged.

SEC. 10. *Be it further enacted*, That each of the inspectors of commercial fertilizers shall be provided with bottles of not less than eight (8) ounce capacity in which to place samples of commercial fertilizers and fertilizer materials drawn by him; and it shall be the duty of each inspector of commercial fertilizers to draw with such an instrument as shall secure a core from the entire length of the sack of commercial fertilizers and fertilizer materials, as he may be directed by the Commissioner of Agriculture to inspect or that he may find uninspected, and in the performance of his duty he shall carefully draw samples as follows:

In lots of ten packages or less, from every package; in lots of from ten to one hundred packages, from not less than ten packages; in lots of one hundred packages and over, from not less than 10 per cent of the entire number. And after thoroughly mixing the samples, as drawn, he shall, by the method known as "quartering," draw from such thoroughly mixed samples two sub-samples, and with them fill two sample bottles, and shall plainly write on a label on said bottles the number of said samples, and shall also write on the label on one only of said bottles the name of the commercial fertilizer, acid phosphate, or other fertilizer material, also the name of the manufacturer. He shall then seal both of said bottles, and shall forward to the Commissioner of Agriculture the said samples so drawn by him, stating the number of sacks from which the samples were drawn, and a full report of the inspection written on a form prescribed by the Commissioner of Agriculture, which report must be numbered to agree with the number on the bottles; and in said report shall be given the name of the commercial fertilizer or fertilizer material, the name of the manufacturer, the guaranteed analysis, the place where inspected, the date of the inspection, and the name of the inspector; and it shall be the duty of said inspectors to keep a complete record of all inspections made by them on forms prescribed by the Commissioner. Before entering upon the discharge of their duties they shall also take and subscribe before some officer authorized to administer the same an oath to faithfully discharge all the duties which may be required of them in pursuance of this Act.

Any person not a dealer in, or agent for the sale of, any commercial fertilizer who may purchase any commercial fertilizer in this State for his own use, and not for sale, may take a sample of the same for analysis, which analysis shall be made by the Department of Agricul-

ture free of charge. Such samples for free analysis shall be taken by the purchaser in the presence of the person, company, or agent selling the commercial fertilizer, from at least 10 per cent of the sacks or other packages comprising the whole lot purchased, and shall be thoroughly mixed; and at least one pound of the material, after mixing, must be put into a jar or can, securely sealed, and marked in such a way as to surely identify the sample and show by whom it was sent, without giving the name of the commercial fertilizer or the person from whom it was purchased, and must be forwarded to the Commissioner of Agriculture. The purchaser shall also send with the sample a certificate signed by himself and witness, or by two witnesses, stating that the sender has purchased the commercial fertilizer for his own use, and not for sale, and that the sample was taken in the manner prescribed in this section; provided, however, that if the person, company, or agent shall refuse to witness the taking of the sample, then the sample may be taken at the time of the purchase in the manner already prescribed, in the presence of two witnesses, who shall certify to the manner of taking the sample. The purchaser shall preserve the official label from one of the bags or other packages sampled, to be sent to the Commissioner after having received the report of the analysis of the sample, and at the same time he shall furnish to the Commissioner the name and address of the firm of whom the commercial fertilizer was purchased and the amount purchased; and any person having sent a sample for free analysis, under the provision of this section, who shall, after having received the report of the analysis of same, refuse to furnish the required information, shall thereafter forfeit the privilege of free analysis of commercial fertilizers under this section; but if any sample shall have been submitted for free analysis, without all the requirements of this section having been complied with, the Commissioner shall inquire into the case, and may accept sample for free analysis, if he believes that it is a fair sample of the commercial fertilizer as it was delivered to the purchaser.

SEC. II. *Be it further enacted*, That a sample of all commercial fertilizers or fertilizer materials, drawn by the official inspectors and filed with the Commissioner of Agriculture, shall be marked by number and delivered by said Commissioner to the director of the Experiment Station, who shall make a complete analysis of the same and certify under the same number as marked, said analysis to said Commissioner, which shall be recorded as official and entered opposite the brand of commercial fertilizer or fertilizer material which the mark and number represent; and only the said official analysis of such commercial fertilizer or fertilizer material which the mark and number represent, and only the

said official analysis of such fertilizer or fertilizer material, under the seal of the Commissioner of Agriculture, shall be admissible as evidence in any of the courts of this State on the trial of any issue involving the merits of such commercial fertilizer or fertilizer material.

SEC. 12. *Be it further enacted*, That the Commissioner of Agriculture shall have authority to establish such rules and regulations in regard to the inspection, analysis, and sale of commercial fertilizer and fertilizer material as shall not be inconsistent with the provisions of this Act, and as in his judgment will best carry out the requirements thereof.

SEC. 13. *Be it further enacted*, That nothing in this Act shall be construed to restrict or avoid sales of acid phosphate or any other fertilizer material to each other by importers, manufacturers, or manipulators who mix fertilizer materials for sale, or as preventing the free and unrestricted shipments of material to manufacturers or manipulators who have registered their brands as required by the provisions of this Act.

SEC. 14. The Commissioner shall annually analyze, or cause to be analyzed, at least one sample of every commercial fertilizer sold or offered for sale under the provisions of this Act; and he shall publish in one or more bulletins the analyses made during the year, together with relative commercial value of each commercial fertilizer computed from its analysis, as he may determine, and the analysis guaranteed by the manufacturer. It shall be the duty of the Commissioner of Agriculture to ascertain as near as may be the actual cost of blood, tankage, fish scrap, nitrate of soda, cottonseed meal, and other materials from which ammonia or nitrogen is obtained; the cost of all phosphate rock, together with a description of the treatment with acids, the grinding and general manufacture of acid phosphate, and the actual cost thereof as near as may be; and to communicate with dealers both in this country and in Germany as to the cost of muriate of potash, kainit, and other sources of potash, and to publish the same in a bulletin. But he shall not expose to the public the name of any manufacturer in this State who may give him information on this subject, nor shall he divulge any information concerning the private business of any corporation or company manufacturing commercial fertilizers solely in this State; provided, such corporation or company is not a part or branch of any trust or combination. Said Commissioner of Agriculture shall also make and publish in every fertilizer bulletin a price list of the market value of all the materials of which commercial fertilizers are made, and revise the same as often as may be necessary. Said bulletin

shall be furnished free to any manufacturer of or dealer in commercial fertilizer or fertilizer material sold within this State, and to any consumer of commercial fertilizer or fertilizer material within the State who may apply for same.

SEC. 15. *Be it further enacted*, That any person selling or offering for sale any commercial fertilizer or fertilizer material without first having complied with the provisions of this Act shall be guilty of a misdemeanor, and, on conviction thereof, shall be fined not less than \$50 nor more than \$500.

SEC. 16. To facilitate inspection of commercial fertilizers the Commissioner of Agriculture is authorized to require all manufacturers making shipments into or within the State to notify him of the kinds, amounts, dates, destinations, and consignees of all such shipments.

SEC. 17. It is hereby made a part of the duty of the director of the Tennessee Experiment Station to annually analyze, or cause to be analyzed, all samples of commercial fertilizers or fertilizer materials forwarded to him by the Commissioner of Agriculture at a uniform rate of \$5 per sample, and to further assist and cooperate with the Commissioner of Agriculture in making such practical tests of the relative value of the different commercial fertilizers offered for sale on the type soils of the State as in his judgment may be advisable.

For the purpose of carrying out this work, the Commissioner is hereby authorized to spend a sum not to exceed \$600 per annum.

The result of these investigations are to be prepared and submitted in the form of a bulletin to the Commissioner of Agriculture, who shall annually cause them to be published as a part of the bulletin giving the analysis of the commercial fertilizers and fertilizer materials examined during the fiscal year.

SEC. 18. *Be it further enacted*, That, by the authority aforesaid, all laws and parts of laws in conflict with this Act be, and the same are hereby repealed; and that this Act take effect from and after the first day of June, 1903, the public welfare requiring it.

Passed April 9, 1903.

L. D. TYSON,
Speaker of the House of Representatives.

ED. T. SEAY,
Speaker of the Senate.

Approved April 15, 1903.

JAMES B. FRAZIER,
Governor.

RULES AND REGULATIONS.

In accordance with Section 12 of the foregoing Act, the following rules are hereby prescribed:

1. The grade of the fertilizer is to be considered a part of the "brand name or (and) trade-mark," and may immediately precede or follow the same, if used at all.

2. It is optional with the manufacturer whether he brands the grade on his sacks or not; but if he does brand the grade on the sacks, then the goods must conform to the requirements of the grade, as stated in Section 4 of the law.

3. In branding the word "potash" the characters, " K_2O ," heretofore in use, are to be omitted.

4. In case of goods containing 10 per cent available phosphoric acid, 0.82 per cent nitrogen, and 1 per cent potash or such mixtures as 9—1.65 or 8—0.82—3, or other combinations which do not reach a total commercial value equal to that of the standard fertilizer (which is 8—1.65—2), such mixtures are not to be designated by any grade at all. Such goods may be offered for sale and branded with any name the maker desires to give, provided such name does not indicate that they belong to a high or standard grade.

5. In printing bags containing acid phosphate only, or acid phosphate and potash, where all three ingredients of plant food are not claimed, it shall be optional with the maker whether he brands only the guaranteed ingredient—as, for instance:

Available phosphoric acid	14 per cent.
Or he may brand:	
Available phosphoric acid	14 per cent.
Nitrogen	None.
Potash	None.

But in this latter case the letters of the word "none" shall be plain and distinct and of the same size type as the name of the elements standing opposite them.

6. In the case of goods containing less than 1.65 per cent nitrogen, they may be branded as "ammoniated" goods, "guano or fertilizer," or other words implying that the same is an ammoniated superphosphate, provided they contain not less than 0.82 per cent nitrogen.

7. A goods containing 10 per cent available phosphoric acid, 0.82 per cent nitrogen, and 3 per cent potash, cannot be branded "High Grade," since it has not as high a commercial value as the legal high grade.

8. No manufacturer has the right to print the word "ammonia" at all on his sacks.

9. Manufacturers of fertilizers desiring to sell or offer their goods for sale in Tennessee must procure from the Commissioner and securely attach to each bag, barrel, or other package of fertilizer, before it leaves the factory, a certificate of inspection, or "tag," as required by Section 5 of the Act printed above.

10. No certificate of inspection, or "tag" attached to any package of fertilizer, will be recognized as valid unless the same bears the facsimile signature of T. F. Peck, Commissioner.

11. All tags must remain on the packages to which they are attached until they go to the hands of the consumer, and must not be detached by him until he is ready to use the fertilizer.

12. Ground raw bone, or meal, must contain not less than 20 per cent total phosphoric acid and 2.46 per cent nitrogen.

13. Cottonseed meal, when sold as a fertilizer, is subject to tax, and should be tagged as other fertilizers are.

14. The sale of ground raw phosphate rock is not prohibited, but is not tagged as a fertilizer by the Department of Agriculture.

RULE No. 15.

Each and every manufacturer of commercial fertilizer doing and expecting to do business in this State, shall register each brand for the calendar year beginning with January of each year.

T. F. PECK,

Commissioner of Agriculture.

State Capitol, Nashville, Tennessee.

December 17, 1912.

NOTE.—For cost of tags, see Section 5 of the foregoing Act.

CAUTION.

Agents, dealers, and users of fertilizers are warned against all such goods as are sent into this State without inspection tags attached. Manufacturers who are unwilling to submit their brands to analysis should not be patronized.

Furthermore, agents and dealers handling goods shipped into the State in violation of the law are liable to indictment and prosecution.

Any tags left in the possession of the manufacturers shall not be used for another season, but shall be redeemed with new tags within sixty (60) days after the close of the Department's fiscal year, which fiscal year shall be comprised between the dates of June 1 to June 1, inclusive.

Special attention is called to the above paragraph, as there have been many manufacturers who call upon us to redeem tags after we close the fiscal year.

January 1, 1913.

T. F. PECK,
Commissioner.

RELATION OF BEE-KEEPING TO HORTICULTURE.

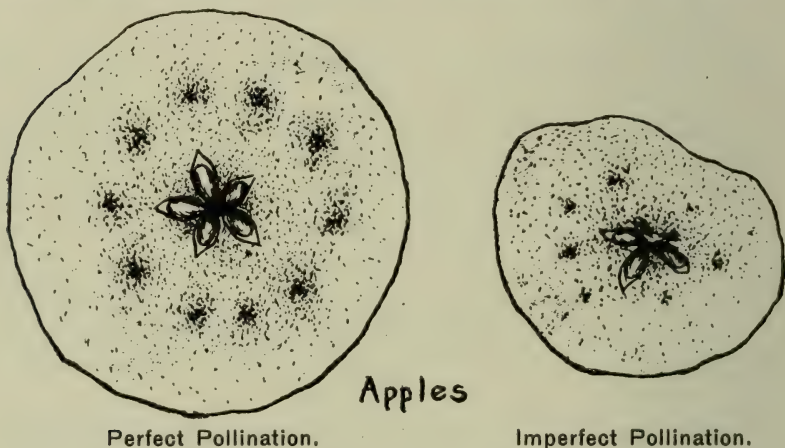
BY DR. J. S. WARD, STATE INSPECTOR OF APIARIES.

Paper read before the State Horticultural Society at its Annual Meeting in Nashville, January 29, 1913.

Outside of the bee-keeping world the great majority of people think that the only benefit humanity receives from bees is the production of honey and wax. It is not generally known nor even understood that bees were created not so much for the purpose of gathering the delicious sweet for mankind, as for carrying the pollen grains from one flower to another, so that these may bear fruit and seed. The real economical value of the bees is to be found in the work of fertilizing and cross-fertilizing seed and fruit-bearing plants so valuable to man; the honey and wax is secondary.

Comparative anatomy and physiology between animal and plant life is one of nature's most interesting studies. Animals have a skeleton, so does the tree in its cellulose tissue; animals have a skin, so does vegetation in its bark; animals have a circulation, lungs, and digestive ferments; the tree presents corresponding organs and functions in the flow of its sap, in the respiration and transpiration of its leaves, and in the digestive function of its diastase ferment. Stronger still is the analogy when we come to the study of the anatomy and physiology of the generative organs. The sex organs exist in plants and flowers very much as in animals, and fertilization before fruitage is as absolute in one as in the other. In some species the male and female organs are found on different plants, as in the mulberry; again, these organs will be found in different flowers on the same growth, as in the common rag weed, also sometimes called bitter weed, or hog weed. Here the stamens and pistils occupy two distinct and entirely unlike flower.

Common corn is another example of this class of plants that bears the sex organs in different flowers on the same growth. In the great majority of instances both organs are found in the same flower. No matter what the arrangement may be it is absolutely necessary that the pollen grains from the anther or the male part of the blossom reach the pistil, the female part of another. In some flowers the anthers reach maturity and throw out the pollen before the seed chamber is developed or the stigmas receptive. In the willow bush we find a good example of this condition. In other plants the pistils mature before the anthers ripen as in the common figwort and the horse chestnut. Again we have flowers whose anthers and pistils mature at the same time, but because of their relative position self-fertilization is impossible. Other arrangements might be mentioned showing the impossibility of self-fertilization and nature's demand for cross-breeding. All of this also



tends to confirm the popular belief in the danger of close in-breeding in animals as well as in plants and the desirability of cross-breeding in stock and cross-fertilization in plant life.

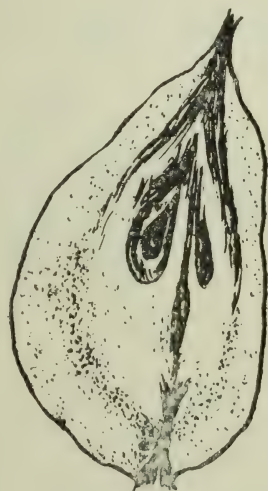
A German writer by the name of Sprengel published a book in 1793 on "The Secret of Nature in the Form and Fertilization of Flowers Discovered," in which he claimed the independent creation of species through self-fertilization. Later on other investigators reached different conclusions; among them was Andrew Knight, whose experiments proved to him that in no plant does self-fertilization occur for an unlimited number of generations. It was not until after the appearance of Darwin's "Origin of Species" that Knight's theory was emphasized in a general law of nature. In Darwin's second work entitled "Various Contrivances by Which British and Foreign Orchids

Are Fertilized by Insects" he sums up his work by stating that "Nature abhors perpetual self-fertilization."

The pollination or fertilization of plants is brought about in two ways: first, by the *wind*; second, by *insects*. Plants whose flowers are small and inconspicuous as the willows, pines, oaks, and birches have very light and dry pollen, which in favorable weather may be blown about and pollinate many flowers, but often the wind is ineffective on account of the pollens being sticky by reason of moisture in the air in the form of rain, heavy dew or fog. Most of the flowers, however, are not of the "wind bearing" type and require some other agents than the wind to carry the pollen, and these agents are the in-



Perfect Pollination.



Imperfect Pollination.

sects. Insects go from flower to flower gathering pollen or nectar for food, and in crawling over the stamens and pistils they get their little bodies covered with the pollen grains and easily, effectively transfer them to the stigmas of other blossoms, resulting also in the cross-fertilization that nature demands. Observation and experiments teach that without insects there is but little pollination and without pollination the blossoms with their pistils wither and die without fruitage.

Muller in his investigations found that in Germany 2,750 out of 6,231 visits of insects to flowers were made by the *Hymenoptera*, and of this number (3,481) more than half (2,191) were made by the *Apidae*, the family to which the honey-bee belongs. Waite, in his bulletin on "The Pollination of Pear Flowers" (Bul. 5, Div. of Veg. Pathology, U. S. Dept. Agr.) after mentioning a large number of species of insects

which visit pear blossoms says: "The common honey-bee is the most regular and important abundant visitor, and probably does more good than any other species."

The bees need protein as well as carbohydrates to make a well-balanced ration for the young growing insects. The honey, which contains the saccharin or carbohydrates, is stored in large quantities, but the pollen, which contains the protein material, is not stored in any appreciable quantity; it is practically gathered from day to day. Nature thus compels the bees to use every opportunity to gather pollen for the maintenance of the colony—for self-preservation, and thereby inducing them to pollinate the blossoms, which would otherwise be unproductive.

Dr. Fletcher, in a paper read before the Ontario Association of Bee-Keepers, said: "It can be shown that, owing to its size, weight,



Bees Carrying Pollen.

and habits, no insect is so well calculated to insure the fertilization of fruit blossoms as the honey-bee, which flies rapidly from plant to plant, and, by running over the flowers in search of pollen or nectar, brushes off the pollen and carries this vitalizing element on the hairs of its body to the next flower visited."

Dr. Phillips says: "While the honey-bee is, perhaps, no better equipped than other insects, especially other bees, for carrying pollen, there is one respect in which it outranks all others as a valuable asset to the fruit-grower. We are not able to propagate other insects in quantity, and introduce them to orchards at the proper time; but it is a very simple matter to carry in colonies of bees to insure a crop, if the weather is fit for the bees to fly. Many orchardists realize this, and keep bees solely for the benefits derived from cross-fertilization of the fruit blossoms."

Mr. McIntyre at the California State Fruit-Growers Association said: "A gentleman stated that he had a friend in this State who started into fruit-growing several years ago, locating thirty-five miles

from any fruit-growing section, or where any bees were located. The first year that his trees blossomed, and in expectancy of at least some returns from his orchards, what should be the result but complete failure? He was advised to procure some bees to aid in the fertilization of the blossoms. He did so, and since then his orchard has been productive."

Mr. C. J. Berry, of Tulare County, California, whose fruit orchard contains over 400 acres, says: "Bees and fruit go together. I can't raise fruit without bees. Yes, sir'e. I have been all about my big orchard. Two years in succession I have put netting over some limbs of trees; and, while they blossomed all right, nary fruit; while on the same tree, where limbs were exposed to the aid of bees, plenty of fruit."

Dr. Fletcher, of the Ottawa Experiment Station, again says: "It will be found that not only are flowers absolutely necessary to bees,



Buckwheat Flowers Showing Stigmas, Pollen Baskets and Nectar Glands.

as the source of their food—nectar and pollen—but that bees and other insects are no less necessary to most flowers, so that their perpetuation may be secured.

"This fact should be recognized by the fruit-grower above all others; for were it not for insects, and particularly for the honey-bee, his crop of fruits would be far less than they are every year, and even in some cases he would get no fruit at all.

"Failure in the fruit crop is more often due, I think, to dull or damp weather at the time of blossoming, which prevents insects from working actively in the flowers, than to any other cause."

H. W. Collinwood, editor of the Rural New-Yorker, says: "We can easily forgive the bee his short working days when we consider the good he does. There is no question about the debt fruit-growers owe him. People talk about the wind and other insects in fertilizing our flowers; but I am confident that any man who will really take the time and pains to investigate for himself will see that the bee is nearly the whole story. I have seen the certain results of his good work in a neighbor's orchard. Those bees "broke the trees" down just as truly

as though they had climbed on the trees by the million and pulled at them. The appearance of those trees after a few years of bee-keeping would have convinced any fair-minded man that our little buzzing friends are true partners of the fruit-grower."

Thus we see that the interest of the bee-keepers and of the fruit-growers are identical, and instead of clash between them there should be cooperation. They should live near one another or every orchardist should be a bee-keeper or every bee-keeper an orchardist. Dr. Phillips says in substance that it is a conservative estimate to claim that the honey-bee does more good to agriculture in its office as a cross pollinator than it does as a honey gatherer. The estimated annual value of honey and wax in Tennessee is \$250,000. With Dr. Phillips' statement that "the indirect benefits of the bee-keeping industry add annually to the resources of the country considerably more than the amount received from the sale of honey and wax" we feel safe in placing the present value of the bees to the fruit-growers in Tennessee in the fertilization of the fruit blossoms at more than \$400,000 annually. In the honey-bee as pollinators of fruit and gatherers of honey and wax we have a combined valuation of approximately \$1,000,000 annually.

In conclusion will say that the real value of the honey-bee has not been known, not realized and, of course, could not be appreciated. The possibilities of the bee-keeping industry are great and in Tennessee alone can safely be placed at \$2,000,000 annually. Education is needed. Ignorance alone stands in the way of progress along this agricultural line. An educational campaign is pleading for an opportunity which is made possible only by proper legislative enactments and the appointment of competent officials.

A beautiful country home and a 200-acre farm, known as the "Stone Farm," and situated five miles from Fayetteville, was sold Mrs. Grace Gaskell, of Chicago, Ill., the price being \$13,500. Mr. and Mrs. Gaskell have visited eleven states since last August in their search for a country home in the South, and have selected Fayetteville as the most desirable location. The new owners expect to improve the place and make it an ideal country home.

It is well to remember that the old and diseased trees not only take up valuable space in the orchard, but they are liable to spread disease among the healthy trees, and they always harbor pests that are injurious to the entire orchard.

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IN THIS ISSUE:

Maintenance of Soil Fertility Where Tree or Small Fruits Are Grown.

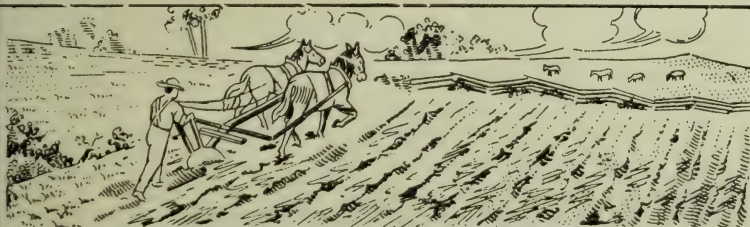
Fruit, Vegetable and Nursery Possibilities in Cumberland
Highlands of Tennessee.

Selecting Good Seed. The Home-Makers of Tennessee

Bee-Keeping on the Farm. Early Irish Potatoes. Forage Poison.

Marketing Mast-Fed Hogs. Dipping Hogs.

Tennessee Dairy Industry. March Crop Report



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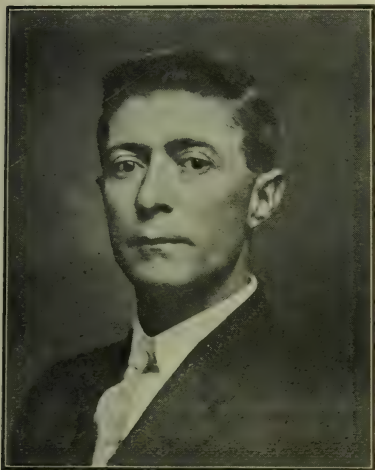
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MAINTENANCE OF SOIL FERTILITY WHERE TREE OR SMALL FRUITS ARE GROWN.

BY R. T. DEBERRY.

(Address delivered before Tennessee Nurserymen's Association, Nashville, January 30, 1913.)



I want to say to you frankly, just as I said to Prof. Bentley, when he asked me to address you upon this occasion, that I feel some hesitation in speaking upon this topic from the fact that what I have to say must be largely theoretical, and except for the fact that in my studies of the maintenance of soil fertility under all sorts of conditions I have been compelled to consider the matter where tree or small fruits are grown, I should decline to discuss this topic at all; but as I have given the subject some study from this standpoint I want to talk to you a short while about the ele-

ments of plant-food which are removed, and consequently must be restored from time to time if we maintain the fertility of soil where these things are grown.

Now the question of keeping up the fertility of our soil where early vegetables are grown is not a very complicated one, as the necessity for using large quantities of barnyard manures or commercial fertilizers if we expect to grow profitable crops, and the further necessity of practicing a system of wide rotation of crops if we are to avoid loss from plant diseases and insect enemies keeps our soil not only reasonably full of plant-food, but keeps that plant-food fairly well balanced.

This statement is especially true where commercial fertilizers are used, as we use such quantities that there is nearly always left in the soil an excess of the mineral elements (potash and phosphoric acid) which stimulate the leguminous crops, that should always follow early vegetables, to such an extent that they take an increased amount of nitrogen from the air and store it up in the soil for the use of succeeding crops, so, as you may very readily see, keeping our land fertile under this system of farming is a comparatively easy task.

But when we come to consider the question under a system of general farming where we cannot afford to use manures or fertilizers with such a lavish hand the problem becomes more complicated, and when we begin to consider it from the standpoint of the tree or small fruit grower it becomes still more complicated, from the fact that whereas we could in the two former systems practice a rotation of

crops to aid us in our work, we are handicapped in this direction where small fruits are grown and entirely barred from using a rotation where tree fruits are grown, so the question of keeping our soil fertile becomes one of considering how to do this under a system of continuous cropping.

We may practice a system of rotation so far as the land between the trees is concerned, or grow different cover crops thereon, but so far as our trees, the crop to which we are supposed to be giving the use of our land, are concerned we cannot rotate, but must allow them to remain there for an indefinite length of time.

I do not want to take up too much of your time, but I do want to call your attention to the amount of plant-food required to produce certain crops and the suggestion may be of value to you in furnishing you some basis from which to figure in trying to prevent the depletion of the soil of those elements of plant-food which must be present if you hope to get maximum crops of fruit that is high quality.

We have long since recognized the fact that all vegetation, whether of tree growth or of other sorts, requires a certain amount, though of course in varying proportions, of identically the same elements of plant-food.

While there are some ten or eleven different elements necessary for the complete development of vegetation, fortunately for us in our efforts to keep our soil fertile most soils are deficient in only three or at most four of these elements, the other elements being present in sufficient quantities to grow any crop which we may desire to produce and the addition of the same amount of these three or four elements, which the crop removes each season, being returned as fast as it is removed by the crop, will keep our soil in practically the same state of fertility from year to year.

The elements mentioned, nitrogen, potash, phosphoric acid and sometimes lime, being the only ones that we are called upon to supply, make it a much easier proceeding to keep up the fertility of our soil than it would be if we were called upon to supply all of the ten or eleven.

The mistake, which in my judgment, the orchardist has been making in not feeding his trees, is that of using forest trees as a comparison in trying to determine what his fruit trees need or rather trying to persuade himself that they need no assistance in the way of plant-food.

Seeing that our land newly cleared of its forest growth was our most fertile land, and knowing that the forest trees had never had any artificial aid in any way, they have jumped to the conclusion that fruit trees could do the same way, quite losing sight of the fact that forest growth and fruit growth are very different in respect to their need of fertilizing elements and that progressive fruit culture demands that quite as much attention shall be given to the matter of providing proper plant-food as is now known to be desirable for the other

and more common crops of the farm that are grown for profit.

We are fortunate in our day in that it is not necessary for each

grower to go into a series of elaborate experiments to determine for himself just how to keep up the fertility of his soil under any given system of cropping, but may draw upon the researches of the various experiment stations for the information needed.

For instance, by referring to Bulletin No. 3 of the Cornell Experiment Station we get the benefit of a study of an experiment that is very instructive as indicating the need of manure for fruit trees, not only in reference to the amount removed, but also in reference to the proportions of the various elements required.

This experiment showed that a crop of 500 bushels of apples removed from the soil 66.8 pounds of nitrogen, 94.5 pounds of potash and 15.5 pounds of phosphoric acid per acre, removing twice as much nitrogen, 50 per cent more phosphoric acid and three times as much potash as fifteen bushels of wheat per acre.

These results are valuable in indicating the rate of soil exhaustion by apple growing, but we must remember that the larger root growth of the tree will enable it to draw its nourishment from a larger area than the wheat which will probably permit of normal growth for a longer period.

It may also be true that trees that can get the food necessary for their growth from comparatively insoluble forms that ordinary field or garden crops cannot use to advantage.

A good deal depends upon the state of the soil when we start an orchard as to whether we begin to use fertilizers at once or not.

On soils that are naturally fertile the tree will usually be able to obtain food enough to provide for a sufficient growth of leaf and wood and in some cases for large crops of fruit unless we at the same time attempt to grow some other sales crop between the trees, but even where this is not done fertilizing should begin as soon as the tree begins to produce maximum crops of fruits.

On thin or light soils it is probably better to begin fertilizing as soon as the trees are set out, and on very poor soils some effort should be made to develop the fertility of the land before setting out the trees.

Now in fertilizing fruit trees it is neither necessary nor desirable that all of the plant-food be in an immediately available form, but it is preferable that the elements be supplied in less readily soluble forms, as it is necessary that there be a constant transfer of the nutritive juices from the tree to the fruit throughout the growing season, while the growth for each succeeding season depends upon nutrition stored up in the buds and branches as well as that taken directly from the soil.

We need nitrogen for the development of leaf growth, trees growing both by leaf and root; potash is needed not only because it constitutes a large proportion of the ash of the wood and more than 50 per cent of the ash of the fruit, but also because it forms the base of the fruit acids. Phosphoric acid is an essential element for the proper nourishment of the tree and to insure ripening, while lime

seems to strengthen the stems and woody portions of the tree, to shorten the period of growth and hasten the time of ripening.

Keeping all these things in mind suggests the use of some basic formula for fruit trees that will not only supply sufficient food for the crop, but will supply that food in balanced form.

The two following mixtures may be recommended for this purpose: One part ground bone, 1 part acid phosphate and 1 part muriate of potash or 100 pounds of each; or 150 pounds bone meal and 100 pounds of muriate of potash. Either of these mixtures may be applied in amounts desired, ranging all the way from 400 to 1,500 pounds per acre, being governed in applying by the size of the crop removed.

These materials furnish the elements in good form, especially the nitrogen content, as one of the chief points to observe in the use of manures or fertilizers for fruit trees is to avoid an excessive application of nitrogenous material or have it in too active a form.

Where very active forms, like nitrate of soda or dried blood, are used it is best to make the application early in the spring so that it may be assimilated before winter begins, as it tends to promote too rapid a growth of wood and fruit which does not ripen well.

In many cases though it will be found desirable to use not less than twenty pounds per acre of nitrogen (equivalent to 125 pounds of nitrate of soda) in addition to the basic formula, this, of course, on the poorer soils, while very poor soils should have 500 pounds of formula No. 2 applied before setting the trees and a like amount used annually thereafter.

In a general way we may by growing leguminous crops and turning them under secure sufficient nitrogen to supply the amount needed over and above what the formulas mentioned will furnish, but where this is done it is best to turn them under early in the season in order not to interfere with the growth of the trees; these crops, if allowed to mature, will not only absorb food that is necessary for the growth of the tree and the fruit, but take up the moisture also and thus tend to injure rather than improve the prospects for a crop.

What I have said so far is with special reference to keeping up the fertility of the soil where apples and pears are the tree fruits grown, but I want to take up a little more of your time and read you from Prof. Voorhees' great work on fertilizers, the result of a series of experiments at the New Jersey Station with peaches.

Three plots were used, one with no fertilization of any sort, one with barnyard manure applied at the rate of twenty tons per acre and the other with a mixture containing 150 pounds nitrate of soda, bone-black superphosphate 350 pounds, and muriate of potash 150 pounds and the statement tabulated below shows the result.

I. THE YIELD WITHOUT MANURE.

Baskets
Per Acre.

1884-1891 inclusive 8 years, average per year.....	65.7
1884-1895 inclusive 10 years, average per year.....	60.3
1887-1891 inclusive (5 crop years) average per year.....	105.0

1887-1893 inclusive (7 crop years) average per year..... 86.2

II. THE YIELD WITH COMPLETE CHEMICAL FERTILIZER.

	Baskets Per Acre.
1884-1891 inclusive 8 years, average per year.....	164.2
1884-1893 inclusive 10 years, average per year.....	183.4
1887-1891 inclusive (5 crop years) average per year.....	262.8
1887-1893 inclusive (7 crop years) average per year.....	262.0

III. THE YIELD WITH BARNYARD MANURE.

	Baskets Per Acre.
1884-1891 inclusive 8 years, average per year.....	169.5
1884-1893 inclusive 10 years, average per year.....	194.7
1887-1891 inclusive (5 crop years) average per year.....	271.3
1887-1893 inclusive (7 crop years) average per year.....	276.8

IV. THE RELATIVE YIELD IN AN UNFAVORABLE SEASON.

	Baskets Per Acre.
1889, unmanured	10.9
1889, fertilized	152.5
1889, manured	162.5

"The first point of value to observe is that on unmanured land the crops were so small after eight years as to materially reduce the average for the whole period, while for the manured and fertilized land the average was not only not reduced but very materially increased.

"The second point to observe is that very much smaller amounts of actual plant-food in quick acting forms were quite as useful as larger amounts of the less available forms existing in natural manure products.

"For the ten years the fertilized plot received 250 pounds of nitrogen, 560 of phosphoric acid and 750 of potash, while the yard manure plot received—assuming the average composition of yard manure—2,000 pounds of nitrogen, 2,000 pounds of phosphoric acid and 1,600 pounds of potash; yet with eight times as much nitrogen, nearly four times as much phosphoric acid and more than twice as much potash, the yield was only an average of eleven baskets per acre in favor of the yard manure.

"The third point to observe is the effect of an abundance of food in overcoming unfavorable weather or seasonal conditions; the year 1889 was extremely unfavorable, the unmanured plot showing a yield of only 10.9 baskets per acre, as against more than 150 each for the other two, proving that the manures stimulated and strengthened the trees enough to enable them to resist such conditions as were fatal to the crop on the unmanured land.

"This point should be carefully considered since the expenses of cultivation, trimming and interest on the investment are quite as great in the one case as the other."

FRUIT, VEGETABLE AND NURSERY POSSIBILITIES IN CUMBERLAND HIGHLANDS OF TENNESSEE.

BY G. M. BENTLEY.



The fact that the highlands of Tennessee are admirably adapted to fruit and vegetable growing is fast coming to be recognized. That part of the state commonly known as the "Highland Rim," with an altitude varying from 800 to 1,500 feet above sea level, has, within the past few years, produced apples, peaches and small fruits, as well as vegetables, especially the Irish potato, that would be prize winners at any fair or exposition.

The quality and quantity of the yield have been a great surprise, even to experts. With the suitable climatic and adapted soil conditions, together with the low-priced land, this rim country bids fair to come into rapid prominence. Not far distant from this section are the great distributing centers, made easily accessible by the splendid railroad facilities afforded by the Tennessee Central Railroad, which passes through the heart of the Cumberland plateau.

Not only for fruit and vegetable, but for another large interest is this section of great promise. I refer to no other than that of growing young fruit and shade trees, ornamental shrubbery and hedge plants.

Tennessee ranks first of all among the Southern States in the quantity and high class of her nursery stock. Today there are 352 nurseries in the state growing trees and ornamental shrubbery to be shipped to all parts of the United States and Canada, as well as to many foreign countries. The reasons for this extended business are clear: a young tree in Tennessee will grow in two years to equal a three or four-year-old tree grown in the North. The growing season for trees and plants in Tennessee is from forty to fifty days longer than that in Ohio and New York, and in rainfall there is the advantage of from nine to ten inches more annually. Thus, it is plain to see why farmers and fruit growers in Tennessee have natural advantages possessed by few.

The prospective orchardist cannot lay too great stress upon the importance of selecting a location suitable as to elevation and soil. The "Highland Rim" has sufficient elevation to evade the late spring frosts together with an air drainage which aids materially in keeping in check fungous troubles which attack both fruit and trees. The soil of this section has proven to be one of the best for growing apple trees free

from woolly aphis. Both as a growing and a fruiting tree the apple does admirably in this section.

Great possibilities await the orchardist and trucker, as well as the nurseryman, who establishes himself in this rim country. The eyes of the progressive are turning toward this region of opportunity and already in DeKalb County there are forty-one nurseries. Overton County has one started this fall. The Cumberland Orchard Company, in Morgan County, incorporated at \$50,000, has set 30,000 peach trees, 15,000 apples trees, 2,500 cherry trees and 100 acres of strawberries. This company controls a large acreage and will increase the plantings this coming spring.

In Cumberland County the Bohemian Cooperative Farming Company has purchased 5,300 acres and is successfully growing the products of the farm, garden and orchard, transforming the plateau into a veritable garden spot. As was said of old, "the stone which the builders rejected, the same has become the head of the corner." May it not be a reality in the development of the agricultural and horticultural possibilities of the Cumberland plateau?

SELECTING GOOD SEED.

By T. F. PECK,

Commissioner of Agriculture.



Every farmer at this time of the year should be considering seriously the question of where to obtain seed for the next year's crop. The scientific farmer has long ago learned that it does not pay to plant any kind of seed bought at any place possible. In the paragraphs following a few of the points that determine good seed will be taken up in such a manner as to enable the farmer to know how to tell good seed.

In the first place, vitality must be considered. Old seed, that is, seed not grown the previous year, will usually germinate to a certain extent and grow, but good results can never be expected from such seed. Usually the plant is weaker and slower in growth; especially is this true of garden crops, and some of the smaller cereals. Corn will grow about as well when two or three years of age as new seed, and very little difference can be noted in its vitality, but never-

theless its use is not to be recommended. In connection with age, do not go to the other extreme and purchase seed that is not mature, due probably to being harvested too early or to bad weather conditions. A rainy season when grains are in the shock or ripe in the field will often cause the seeds to swell or even sprout. Such seeds when planted can never produce as strong plants as if they had been harvested and threshed while in the dry condition. Even after harvesting grains, especially corn, they may be damaged by too cold weather, when not thoroughly dry, causing the kernels to shrivel and decrease greatly in vitality. It is always advisable to test all kinds of farm seeds, even though they were grown at home and good care taken of them. Lustre is another splendid indicator of vitality; old and dead seeds always have a dull appearance. Other conditions being equal, always select as plump seed as possible. The reason for this is manifest—a plant in its early stage of growth must live on plant food stored up in the seed, and necessarily a plump seed contains more food, allowing a more vigorous growth. The weight of a given amount of seed is usually a good indicator of its vitality—the heavier the seed the more desirable it is. Always beware of diseased grain, being careful to avoid especially the stinking smut or any seed that is mouldy or has a scabby outside.

In speaking of purity we refer to trueness to name and freedom from weed seed and inert matter. Some seeds always contain weak seed; particularly is this true of small kinds such as timothy and clover. In purchasing these it is simply a matter of choosing the least of the evils. Avoid introducing new kinds of weeds onto your place. Either raise your own seed or buy from a nearby neighbor when possible. Before making a purchase be sure you are buying from a reliable dealer, one who you are certain will give you the grade and variety that you pay for.

Another point to be considered in buying seed is its breeding, not meaning necessarily that it should have a pedigree, but that it should have been improved through selection. About the only practical and cheap way to do this is for the farmer to raise his own seed. Take for example corn; buy some extra good seed from a reliable corn grower near by, plant perhaps an acre, and from this start select enough seed for the whole crop the following year. While the ear is still on the stalk go over the acre and pick out the desirable stalks. The following year select enough extra fine seed corn grown on this one acre to plant another similar acre to it. In this way a few years of selection will result in a fine type of corn of good breeding and an

increased yearly yield. With the wheat crop or any small cereals the above method can be practiced by varying the procedure to suit the conditions.

Always use home grown seed when possible, because it is adapted to the soil and climate, is usually freer from weed seeds, and you know what you are planting. If not possible to get seed near home always be sure to get it from nearly the same latitude or preferably farther north, never from farther south. Any crop tends to adapt itself to the conditions under which it is grown, consequently a crop grown from seed purchased in a warmer climate will not have time to mature. It is very important that corn be adapted to the climate, but wheat and oats are able to grow under nearly any conditions. In about all cases, unless you are absolutely sure that you can purchase good seed that will suit your conditions, select your own seed.

To become an expert judge of seeds and be able readily to discover adulterations requires a large amount of study and a great deal more practice. The field of work is not open to the average farmer, but every raiser of farm crops can give his attention to seed selection and germination. By paying attention to the points mentioned above, anyone should be able to tell a good from a bad sample of seed. Always buy first class seeds and the final result will be an increase of perhaps a third in the crops over the old method.

FREE BOOKS FOR FARMERS.

Many farmers are not aware that the government publishes several valuable books for free distribution. The books are apportioned to Senators and Congressmen, from whom they can be obtained by merely asking for them. Among the most useful of these books are the Agricultural Year Books, that for 1911 being the latest issued. The government also publishes a very practical book on "Diseases of the Horse," and another on "Diseases of Cattle," and a report of the Bureau of Animal Industry, of special value to stock raisers. Asking for copies of these books does not place the citizen under any obligations whatever to the Senators and Congressmen, as the books are printed by the government and paid for by the taxpayers. If you are interested, send your request to your Senator or member of Congress.

Eat apple sauce, baked apples, every kind of stewed fruit, prunes, figs, dates, etc., and raw fruits, if they agree with you, instead of pies and puddings.

THE HOME-MAKERS OF TENNESSEE.

BY ADA COOKE SETTLE.



It has not been so many years ago that such organizations as the Home-Maker's Section of the Middle Tennessee Farmers' Institute were entirely unknown. The farm woman as an individual and as a factor in organized effort was given very little thought indeed until a comparatively recent time. The public at large knew she existed; it knew that on nearly every farm a farm woman was helping the farmer make a farm home; the publishing world recognized her existence in a few second-rate columns of household matter printed on the back pages of the agricultural

papers and magazines, but the importance of her work to the whole country was hardly recognized.

Uncle Sam, always at heart a staunch supporter of women's rights, was among the first to realize the potentiality of the farm woman's living. There were bulletins for farmers; why not bulletins for farmers' wives and daughters—in fact, for all sorts of women, both city and country bred? So the expert writers on bread-making, poultry-raising, dairying, canning, preserving and kindred subjects were put to work, and now women can obtain from the United States Department of Agriculture, Washington, printed matter of the utmost accuracy on nearly any subject pertaining to household economics.

While the United States government has been printing and distributing this propaganda of the home, spreading out over the country like live wires of help and inspiration has run the chain work of the farmers' institutes, conducted by the Departments of Agriculture in the different states. At first these were for men alone, but it soon became evident that the farmer as a traveler is a binomial quantity; he likes to have the woman go when he goes. So gradually the woman interest crept into the men's meetings. But it remained for Tennessee to originate such fully organized and conducted separate bodies for women as the Home-Makers' Sections of the Tennessee Farmers' Institutes.

There are granges and institutes for women in other states, but nothing like the Home-Makers' Sections of Tennessee. Realizing the value of cooperation, the Department of Agriculture's reasoning was not for a woman's institute apart from the men's, but a section composed of women, working in harmony with the men of the Farmers' Institutes; being a part of the whole, and at the same time a whole to themselves.

To this end cooperation has become the watchword of the Farmers' Institutes of Tennessee and every farmer who attends the meetings held in the three divisions of the state takes to the sessions a livelier interest, a keener anticipation, because the programs presented are open to his women folks as well as himself, with separate programs given by the women assisted by men, and open to men.

Such wise and generous conduct of official bodies has far-reaching effect.

The farmer who attends a meeting accompanied by his wife, daughter or sister naturally broadens in view when he finds the institute serving him trebly through himself, his woman companion, and through both as one; three channels through which his home is benefited. For, while he is making careful notes from the splendid addresses on soil, drainage, crop rotation, etc., his wife is doing likewise with subjects ever dear to a woman's heart—home in general, home dressmaking, home cooking, babies, and at the same time the farmer and his wife are enjoying discussions of equal interest to both. The gentler sex is naturally fond of debate, and one could go a long way before finding such congenial discussions as take place in the Woman's Sections of the Tennessee Farmers' Institutes.

Everybody is expected to tell what they know and every woman can imagine what a lively affair a discussion on "How to Feed Babies" might prove. No woman could resist that subject. At the last session of the Home-Makers of Middle Tennessee this topic brought out every means known from biscuit tea to boiled buttermilk straight.

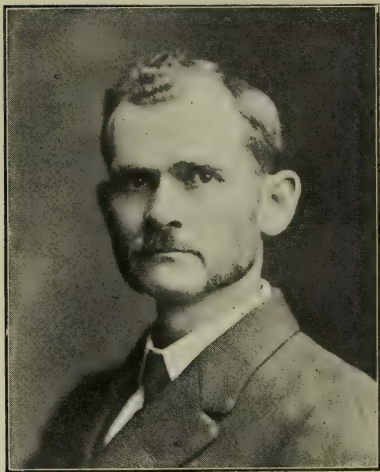
The splendid feature about this home-making work, though, after all, lies no more in the helpfulness of the subjects touched than in the thorough cooperation it is bringing about among all women of both town and country. Women are learning more and more each day that in union lies strength. They are finding that the secret of man's success in business, organization of labor, and direct methods of application, are equally applicable to the home, and the true significance of the word "home" is being promulgated abroad. The little word "home" has always stood for the beautiful, the ideal. How to attain the reality of its meaning women are learning from one another.

The home-making instinct dwells in nearly every woman's heart. The right woman touches to adornment and home-like cheer any habitation that is hers. Through the exercise of kindness and intelligence women bring to the detailed routine of household labor the magic aid of home-love, and it is the knowledge of how to apply love and method for which the Home-Makers Sections of Tennessee stand.

There is a tendency among poultrymen to belittle the old-time advice to whitewash the interior of the poultry houses. Nevertheless, we keep on whitewashing once or twice a year, and find that it prevents dampness, purifies the place, kills vermin and makes the houses look neat and inviting.

BEE-KEEPING ON THE FARM.

BY J. S. WARD, STATE INSPECTOR OF APIARIES.



The interest in bee-keeping on the farm is annually growing. More and more is it being realized that it is a profitable industry and that it can be made to yield larger profits for the amount invested than any other ordinary branch of agriculture. How many farmers make 6 per cent on their ordinary farm investments? How many make 50 or even 25 per cent on any of the side lines, such as poultry, sheep, hogs, fruit growing and dairying? In intelligent, careful bee-keeping one may double his investment the first year and have it all practically clear profit in the suc-

ceeding years. In other words, each swarm of bees in a modern movable frame hive will cost about \$3, and if given careful, scientific attention will yield the first year from \$4 to \$6 and sometimes more. After the first year this annual cost will be only about fifty cents per hive for wax foundation and an occasional painting. A low average income from each hive from year to year will be about \$5. A number of times I have been censured at the close of my lecture on bee culture for placing the annual yield per colony at this low figure (\$5). My complainants would claim \$8, \$10 and sometimes \$15 and \$20 per hive. Such heavy yields are frequently obtained in good honey years and where not too many hives are kept in one place. Take it from year to year the average yield from the large and small apiaries can be conservatively placed at about \$5. Think what that means when a man has 100 hives. Where is there a side line on the farm that will even equal it?

Again, the labor required to care for an apiary of 50 or 100 stands is hardly to be considered, for much of the work can be done at times when other farm work cannot be done. Having a good honey house, the apiarist can work during the cold, wet days of winter nailing together and painting his hives; wiring the frames and putting in wax foundations, labeling his cans and bottles, melting up old combs, etc. When the spring days come and the honey flow is on, an average of one hour each day in the bee yard putting on empty supers and taking off supers filled with honey will be a fair estimate of the time required. The extracting of the honey or grading of the sections for the market can be done at one's leisure on wet days or during the after-supper hours. Of course the amount of labor required depends upon the size of the apiary and the strength of the honey flow.

Observe that in all this I have referred to intelligent, scientific bee-

keeping. I am talking about the man who has posted himself—knows how and is aggressive. Ignorance or carelessness in bee-keeping means failure. Don't attempt to keep bees unless you have educated yourself in all the modern, up-to-date methods and expect to be careful and energetic.

Tennessee offers many advantages for bee-keeping and with proper education and protection the industry could easily be brought from an annual income of \$250,000, as at present, up to the magnificent sum of \$2,000,000. Is not the possibility of such an asset to the people of the rural districts worthy of consideration and attention? Our winters are not so cold that bees have to be put in cellars as in the Northern States, where the losses from freezing are heavy. Neither do we have to buy expensive winter hives or winter cases. We simply see that the bees have plenty of stores, and let them remain outdoors all winter in the summer hives. Again, we have but little of the deadly bee diseases in the state, and having an apiary law and an Inspector of Apiaries, we hope to check the progress of these diseases, which have cost the agricultural interests in other states thousands and thousands of dollars. New York alone during the years of 1899 and 1905 spent over \$100,000 fighting foul brood diseases, to say nothing in the losses in honey and wax and the use of the bees in the pollination of fruit blooms. We will have no such losses in Tennessee.

Again, Tennessee's flora yields nectar in abundance. Many of its sections could be referred to as paradises for bees. All over the state do we have in the spring time acres and acres of blooming white clover from which we get the finest of honey. Scattered over the state are hundreds of farmers who are tied to the post of constant toil for the necessities of life. The children of many of them are being deprived of educational advantages to help stay the "wolf" from the door, when there is enough honey going to waste in the fields, along the ditches, in the fence corners, over the waste land and in the forest to help make them independent if they would only bestir themselves to the possibilities and gather in the harvest which nature has placed at their doors.

SUCCESSFUL FARMING CONTAGIOUS.

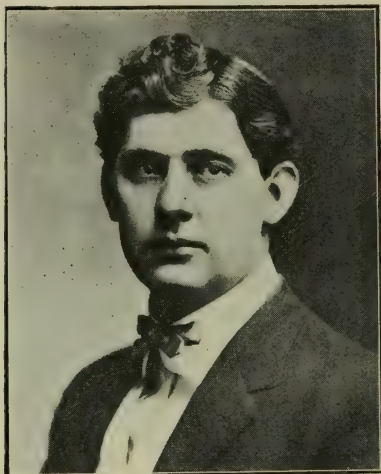
There is one thing about farming which is not true of some other industries, and that is that each farmer is really benefited by the success of his neighbors. In a progressive neighborhood, where good stock is kept and where farming is generally profitable, roads and schools are better, the price of farm land is higher; and, owing to the fact that a great quantity of farm products is offered for sale, markets are better; so boost your neighbors, and by so doing help yourself.

Don't forget that if the sheep are not kept constantly in good condition the quality of the wool is affected.

TENNESSEE AGRICULTURE

EARLY IRISH POTATOES, PREPARATION, PLANTING, CULTURE, HARVESTING.

BY A. L. GARRISON, CHIEF FEED AND SEED INSPECTOR, DEPARTMENT
OF AGRICULTURE



In a recent letter written by Wm. Hart Harrison and published in one of the farm magazines, his views coincide with my own so nearly on the preparation, planting and culture of early Irish potatoes, that I can hardly, in the preparation of this article, get away from his wording and phraseology; however there are a few points on which we differ but which do not materially affect the result, but will be pointed out in this article.

Irish potatoes require soil of a moderately light, loamy nature. The field for the potato crop should have been heavily manured with at

least ten tons per acre. Mr. Harrison suggests that this manure be broadcast and turned under. I think a better plan is to turn the field, then broadcast the manure and in the preparation of the seed bed it is pulverized and mixed with the soil. The disc harrow is the best tool to use in this preparation. It is hard to emphasize the importance of a thorough seed bed preparation enough. When you think you have the soil in such a condition that it could not be improved, do the job over again. Then if you do not get a chance to do any more preparatory work you can go ahead with the planting. The seed bed being ready, I select as near medium-sized tubers as I can get. While I believe the largest tubers are better, yet, owing to the cost, I use the medium size. These are cut two eyes to the piece, making the pieces as large as possible, as the piece of seed potato sustains the plant until it takes root.

In marking or laying off the field I use a No. 5 turning plow, making the furrow as deep as possible and about three feet apart. In this furrow is scattered about 500 pounds 16 per cent acid phosphate. I follow this with an ordinary bull tongue plow, in the bottom of the furrow, which mixes the phosphate with the soil. The seed is then dropped one piece to every twelve inches. The furrows are then filled by running on each side with the same No. 5 turner.

This will leave the field in ridges eight or ten inches high. It is left in this condition until the potato plant is within an inch of the surface. Then take an ordinary drag harrow and cross the ridges. This, in my opinion, is the best cultivation the crop gets. It is not only advantageous to the potato plant, but it gives a set back to the

first growth of weeds. Within three or four days after this is done, the one-horse cultivator should be brought forward and be kept in use at least once or twice a week until the potatoes are in bloom. The last time you go over with the cultivator sow about one bushel of cow-peas per acre; in about ten days the potato plants begin to die and the peas get a chance. When they mature the mowing machine is put on and enough hay taken off the field to pay for all fertilizer and labor incident to the potato crop, besides the field is left clean and loose for the potato harvest. When you are ready to dig the crop, sow one and one-half bushels of rye per acre. Use the same small plow set to run deep. Run three times to the row, once on each side, then under the potatoes, turning them out. This practically works all the land. Two or three men can pick up and sack almost as fast as they are plowed out.

In the afternoons use the drag harrow to level the part gone over during the day. This will find what potatoes were missed in the first picking besides getting the land in good shape for the rye.

After the crop is all pitted, "figure up," and if your yield is not upward of 200 bushels per acre (the season considered) you had better kick yourself, because you have slept on the job somewhere.

LEUCO-ENCEPHALITIS (FORAGE POISON) (BLIND STAGGERS.)

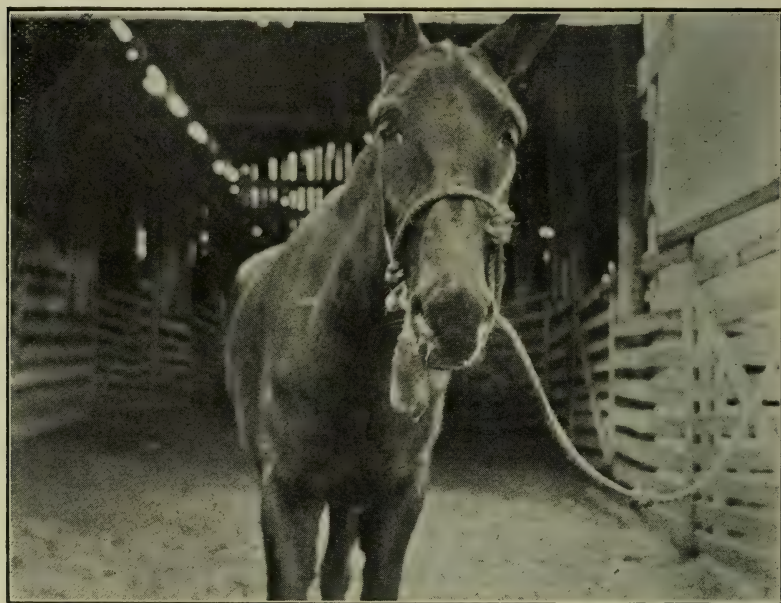
BY GEO. R. WHITE, STATE VETERINARIAN.



It is a disease caused by the ingestion of mouldy or decomposed feed, which affects the brain substance in such a manner as to actually cause degeneration of the cells of the brain. It has been especially prevalent in Tennessee during last fall and this winter, and judging from current press reports of other states I am led to believe it has also been unusually prevalent in most of the Southern and Central States. Its origin or cause has in most instances been traced to bad corn and hay. I know of several farmers who have lost as many as four, six and eight head

of horses and mules this season from feeding unsound or damaged corn. Ensilage is an exceedingly unsafe feed simply on account of its tendency to mould, decompose and sour, in which condition it readily causes "blind staggers." I recall one instance a few years ago where a farmer in Middle Tennessee was preparing twenty-four mules for market, ignorant of the danger of feeding ensilage to horses and mules,

or unthoughtedly he gave them a bushel basket half full as a supper ration. When the owner went to the barn the next morning he found eighteen of these mules already dead and the remainder fatally sick from "forage poison." Another extensive outbreak of "blind staggers" which came under the writer's notice was readily traced back to the inferior grade of clover hay which was being fed to them. Right here in Nashville no longer than last week a man in very moderate financial circumstances had the misfortune of losing three horses and one mule from "blind staggers," caused by feeding decomposed hay which had been "ricked" in the field for two years. Of course, losses such as this and others which I might mention should be object lessons and warnings to others to more carefully select grain and forage before it is fed to animals. "Blind staggers" is the one disease which is easier



Leuco-Encephalitis (Forage Poison) in Mule.

to prevent than it is to cure, hence stockmen should take notice from other losers and carefully inspect the ration allowed. If found faulty, by all means reject it. However, I have no hesitancy in saying that nine-tenths of the cases which have come under my observation were caused by feeding inferior corn. Leuco-encephallitis is one of the most fatal of all animal diseases. It is even more fatal than that much-dreaded disease, tetanus ("lock jaw").

Symptoms.—There is a great variation of symptoms, which vary in almost each individual case. The severity of the symptoms depend largely upon the temperament of the animal and the amount of brain cell changes which have taken place. Some animals become sleepy and sluggish and quiet, while others become nervous, excitable, delirious

and in some instances violent. The most frequent symptoms observed is inability to swallow, although mouth contains food; staggering gait, impaired vision, resulting in many instances in total blindness; twitching and contraction of the voluntary muscles. Temperature usually normal or sub-normal. Later the animals may become restless, delirious, paralyzed and unable to stand quietly, resulting in unconsciousness, coma and death, usually from exhaustion. Death in most instances takes place within thirty-six hours after the onset of the first symptoms. Whenever one horse in a stable develops "blind staggers" all the other animals should be removed or the stable thoroughly cleaned by removing every vestige of grain and forage. A complete change of diet is absolutely necessary as it is impossible to definitely determine what particular part of the feed is responsible for the disease. Where the disease has developed in horses and mules I have always found it safe to feed the rejected hay, corn or ensilage to cattle.

Treatment.—On account of the uncertainty of behavior and action of this class of cases it is well to bear in mind the danger of handling them. They are liable to injure the attendant by falling upon them and otherwise. The further fact should be borne in mind that this is the most fatal disease to which horse flesh is heir, and should death occur it should be no disappointment to the owner. Select dark, quiet quarters, where the animal may freely move without getting cast or injured. About four to six quarts of blood should be drawn from the jugular vein after which give one grain arecoline hydrobromate with a hypodermic syringe under the skin. After an interval of one hour, if the animal is delirious, four grains of morphine should be given under the skin and repeated at four to six-hour intervals. Do not drench animals affected with this disease, as in most cases they are unable to swallow on account of paralysis of the throat. All medicine should be given hypodermically. As soon as the animals recover sufficiently to be able to swallow, the following prescription should be administered during convalescence: Iodide potash, 2 ounces, strychnine sulphate, 8 grains; aqua, 16 ounces. Mix and give 2 ounces three times a day. The diet should be restricted to grass and other laxative food.

PROFITABLE MARKETING OF MAST-FED HOGS.

BY S. M. PRICE.

As is well known, many sections of Tennessee have a great many mast-bearing trees, such as beech, acorn, small hickory nuts, etc. Mast produces a good, cheap and quick growth of flesh, but leaves the hog, if marketed direct from the mast, in a condition to be discriminated against in price at all markets. The price is usually two cents less per pound than the price of corn fed hogs.

The object of this paper is to show the farmer how he can secure the full benefit of the growth that has been put on the animal. We give the following actual experience of a Tennessee farmer, Mr. J.

B. Yount, of the Goodlettsville neighborhood. The results he attained are possible for any farmer: Mr. Yount had a lot of 53 hogs of from 25 to 175 pounds when turned on the mast. These hogs had received the usual care during the fall that farmers give to hogs which they expect to keep through the winter. Mr. Yount found that he had a good mast range on which he could run his hogs. This would be no expense to him, so he did as any intelligent farmer would do—turned his hogs to the mast and fed them a little corn each day to keep them coming home. This treatment was kept up until about January 10. The hogs did well on the range. At this time he was offered 6 cents for the best end of the stock and 5 cents for the pigs. About that date the writer being informed by Mr. Yount that he had, or could buy, corn from his neighbor at \$3 to \$3.50 per barrel, and that he also had a good piece of rye that he expected to plow under to improve the land, I advised that I thought that a profit could be had if he would put his hogs on the rye and feed plenty of corn.

This lot of hogs was put up about January 15 (as they had used up the mast by that time) and were gradually fed upon the rye and corn until March 6, on which date they were sold on the Nashville market to the Tennessee Packing & Stock Yards Company, at an average price of \$8.42 per 100 pounds. Mr. Yount guaranteed against the hogs killing soft. After slaughtering it was found that three of the hogs failed to chill out hard, and two were oily. One of the oily hogs was one that had been with the others on mast, but was put in a pen and fed on corn only, not receiving any rye.

Now for financial results, Mr. Yount was of the opinion that at the time he put the hogs on rye and corn that the price offered him then would give him about \$300 for the fifty-three hogs. He fed them ninety barrels of corn which would have brought him not over \$3.50 per barrel, or \$315 for the corn fed, making the hogs cost \$615. The hogs brought him \$743, giving him a profit of \$130 for feeding the hogs fifty days, and in addition he had a fine lot of manure on the rye field.

The result would indicate that the mast can be fed out of hogs in fifty to seventy-five days if given green feed with corn, but not if fed corn alone.

Cows giving over a gallon of milk a day should be fed grain. A good grain mixture is corn chop mixed with bran or cottonseed. A pound of this mixture should be given each day for every three pounds of milk produced.



COURTESY OF THE MORTISTOWN REPUBLICAN.

Eight of the prize winners in the Boys' Corn Club contest in Hamblen County last year. Top row, reading from left to right: Gwin Robinson, 109 bushels; Raymond Wood, 118 1-2 bushels; James Drinnon, 110 2-3 bushels; Ernest Lane, 93 1-4 bushels. Bottom row, Gaines Taylor, 90 bushels; Glenn Anderson, 107 bushels; Henry Tyler, 86 bushels; Clifford Moore, 94 bushels. Hamblen County Boys' Corn Club record for 1912: Largest boys' corn club organized in Tennessee (52) last year; largest number of yields (6) over 100 bushels secured by any county in the State; highest average yield per member (92) secured by any county club in the State.

DIPPING HOGS.

BY DR. WILLIS B. LINCOLN,

Veterinary Inspector in Charge U. S. Bureau of Animal Industry.

Keeping hogs clean is a very necessary part of their care, and every hog yard should be provided with a dipping tank, or better yet, a cement hog wallow constructed as follows:

For use during warm weather make wallow at least six feet wide and eight feet long, one end sloping so as to give the hogs easy access and egress. Make it deep enough so the dipping solution will be about twelve inches deep. It is best to build of cement. For use on warm days in winter the ordinary dipping tank would be best, made in the following manner: Eight feet long on top, four feet on bottom, four feet deep and two feet wide. It will be necessary to drive hogs through this tank during the winter, but the hogs will use the wallow themselves during the summer.

In this wallow a solution of from one to two per cent of any of the various coal tar disinfectants should be kept all the time. In this way the hogs will naturally dip themselves, and in so doing will rid themselves of the following conditions:

Hog Lice.—Where hogs are not properly dipped or greased it is almost impossible to find one free of lice. A lousy hog is harder to fatten than one free of lice, and why feed a hog in order to raise lice? Free him of these pests and let all the feed go to make increased size and weight. Besides dipping the hog, it is important also to clean up the hog yard and pens and disinfect them with the same disinfectant.

2. *Mange.*—This is caused by a very small parasite that lives in the skin. It multiplies very rapidly, causes violent itching, and produces small blisters. The skin appears red and inflamed. The pain and irritation usually cause the hog to act restless, and in many cases the appetite is poor and a very general unthrifty condition exists. Dipping the hog in the two per cent solution of some coal tar disinfectant as mentioned above will remedy this trouble.

3. *Pitch Mange—Eczema.*—This is usually found among hogs that are kept in filthy pens and yards and are poorly fed. It also sometimes occurs in hogs that are kept on marsh lands, owing, probably, to some irritating properties in the soil. The symptoms are very much the same as those of mange, only perhaps more intense. Sloughing of the skin may also occur. The treatment should be preventive. Keep the hogs in clean yards and pens, avoiding such conditions as might irritate the skin, and dip in a one or two per cent solution of some coal tar disinfectant.

4. *Urticaria*.—Nettle rash or Diamond skin disease is caused by irritation of the skin by lice and filth, and by using irritating solutions for dipping purposes. There are plenty of non-irritating coal tar dips to use without using irritating solutions, such as kerosene emulsion, etc. The symptoms of this disease are diamond-shaped blotches on the skin, which come quickly, almost over night, and are more numerous on the ears, sides of the neck, back of arms, or wherever the skin is thin. They appear as swollen red spots and vary in size up to an inch across. Because of the irritation the hog will scratch and rub the inflamed skin and is restless, and there is also a noticeable lack of thriftiness. The treatment is to keep the hog in clean quarters while growing, avoid the use of irritating preparations on the skin, and dip in a one per cent solution of some coal tar disinfectant. At the beginning of an attack of urticaria a physic should be given, such as Epsom salts in the soft food, about one to three ounces to the hog, according to the size.

In all the diseases above mentioned always clean up the hog pens, sheds and yard thoroughly and disinfect same with the solution used for dipping. By doing this, and either dipping the hogs or letting the hogs dip themselves in the cement hog wallow as spoken of above, the farmer will not only cure the aforementioned conditions and diseases, but will greatly aid his hogs in escaping hog cholera as well as other contagious and infectious diseases. He will then have a thrifty bunch of hogs that will turn every ounce of food into meat instead of just existing.

There are large numbers of hogs coming to the market with the various skin troubles mentioned, and, as the skin has to be removed, this causes quite a loss to the slaughterer as well as to the feeder, because the hogs do not make the gains they should from the food fed to them. Let every farmer resolve to put in a dipping plant of some kind, and the results will be so gratifying to him that I venture the assertion that he will never be without one in the future and will urge all of his friends to install one at once. Try it.

TENNESSEE DAIRY INDUSTRY.

Constructive legislation is what has made the dairy industry of other states. Wisconsin has taken first rank within a few years as a dairy producing state by fostering her dairy industry, and is, with other states, shipping millions of dollars' worth of dairy products into the South that ought to be produced here and the money and fertility enjoyed by our town people.

The improved farm area of Tennessee is 10,890,484 acres; of Wisconsin, 11,907,606 acres—only a few more; yet Wisconsin has 1,076,401 more dairy cows than Tennessee. Wisconsin farmers received in 1909 from dairy products sold \$51,238,399, while Tennessee farmers received only \$3,211,978. The difference is not due to markets, for Wisconsin sells dairy products in Tennessee; it is not due to a large difference in improved farm area; it is not due to a better climate, for Tennessee can produce forage crops in all months of the year—it is due to the difference in dairy instruction in the two states.

If dairy assistants could be put into each grand division of the state to cooperate with the farmers, and assist in milk testing, construction of silos and barns, keeping herd records, breeding, establishing associations, and holding dairy meetings, the fertility of our soil would be built up, and our crop production and the returns to our farms increased.

The following extracts from bulletins on this work in other states, compiled in Circular 16 of the New Jersey Experiment Station, plainly demonstrate the value of cow testing associations.

“In discussing the results of the first cow testing association in Nebraska, the Experiment Station bulletin says:

“‘Because it was so apparent that they were not profitable, between eighty and one hundred of the poorest cows were sold before their records were completed. From information available, which induced the farmers to sell their poorest cows, it is thought that the productive capacity of the average herd belonging to members of this association was raised at least 50 pounds butter-fat, or 2,000 pounds of milk per cow, as a direct result of the first year’s work of this testing association.

“‘The dairy department of the University of Nebraska is firmly convinced that at the present time it can render no greater assistance to the dairy industry in the state than can be done through the assistance given in establishing and directing the work of cow testing associations.’

“In Bulletin No. 30 of the New York Department of Agriculture a comparison is made of the production of 535 cows of the same herds the year previous to joining the association with the production during the association year, as follows:

“‘During the year, April 1, 1909, to March 31, 1910, 536 cows of sixteen dairies received credit on the books of the creamery to deliver 2,153,441 pounds of milk. The following year 535 cows of the same herds were credited with 2,423,620 pounds, a gain of 270,179 pounds for the association year, or a money gain of \$8,444.50 for

the association year. Had the same prices been paid for the milk both years the money gained would have amounted to \$8,839.00. The increase of individual dairies are noteworthy. Dairy 7 delivered 59,000 pounds more milk, and received \$1,130.00 more money for the association year.

“The State Department of Agriculture believes in the effectiveness of the cow testing association movement, and will give aid, by furnishing, on request, a farmers' institute lecturer to address meetings of interested farmers.’

“In Bulletin No. 3, volume 8, of the Maine Department of Agriculture, the following statement is made regarding the Oxford County Cow Testing Association:

“During the first six months 39 cows were sold by members of this association, and in the same time 13 cows were purchased. The 13 cows purchased paid, during the remainder of the year, a monthly profit of \$61.23, while the 39 cows sold paid only a monthly profit of \$66.69. The advantage of the summer season and consequent low cost of maintenance were also very much in favor of the 39 cows that were sold.

“The Department of Agriculture became interested in cow testing association work several years ago, and after a careful investigation, became satisfied that it was an entirely practical plan for carrying on dairy testing work, and that the department should exert every reasonable effort in its power to introduce and extend the work in the State of Maine.’

“The United States Department of Agriculture, through the Dairy Division of the Bureau of Animal Industry, is cooperating with state authorities in the organization of this work. In many states where no funds are available for conducting this work, the department has furnished blanks and record books free of charge. In speaking of an association in Sweden that has been in operation for ten years, the United States Department of Agriculture, Circular 179, on cow testing associations, makes the following statement:

“This association had in the tenth year 639 cows. Giving the butter a value of 30 cents a pound and the feed units a cost of 2.6 cents a unit, these 639 cows returned during the tenth year \$18,153.99 more than the same number would have returned during the first year, or nine times as much net profit. The cost of this splendid added income is less than \$1 per cow, or less than \$639 a year.’

“It should be the desire of every dairyman to improve the production of his herd, by raising calves from the best cows in his herd.

In order to do this it is necessary to know the production of each cow. Association records have shown that in nearly every herd where records have not been kept there are several cows that are 'boarders,' or unprofitable to keep. The experience of a dairyman who purchased a \$20,000 farm and gave a \$10,000 mortgage is related by Mr. Helmer Rabild of the United States Department of Agriculture as follows:

"There were seventy cows upon the place when it was purchased. These cows averaged 7,320 pounds milk per year. After keeping records for a year, the owner sold all but twenty-eight of his cows, as they were not making enough profit. He raised the heifers from these twenty-eight cows, and at the end of six years had seventy-one cows. The extra profit which this better herd has given amounts to \$2,580 every year. It was figured that with the profit which he was receiving from his original herd it would take him twenty-nine years to pay off his mortgage, but with the profit which he is now receiving, he can pay it off in three and one-half years.'"

The foregoing clearly shows the result of dairy cooperation and herd testing in other states. The same can be done by farmers in this state, and thus the profits for each farm be increased and the soil fertility built up.

TREATING SCOURS IN CALVES.

Two kinds of scours affect young calves—common scours, which are caused by indigestion, and white scours, or calf cholera.

Calf cholera is contagious, but if a calf gets the disease, it will occur a few days after birth. If the pens are kept clean there is not much danger from this disease usually. Stalls used for calving purposes should be carefully disinfected after a calf is born.

Common scours, which are caused by indigestion, are much more common. The indigestion may be traced to faulty methods of feeding, the most common of which are: Overfeeding, cold milk, sour milk, irregular feeding, dirty pails and dirty stables. When a calf shows signs of the scours, the milk supply should be reduced one-half, and the amount gradually increased as the calf shows signs of improvement. This usually will cure them, but if it does not, feed about a tablespoonful of soluble dried blood, and stir in well with the milk. Dried blood not only acts as a tonic, but it has some food value, and is often fed even when the calves do not have the scours.

If the calves have the scours very bad, the formalin treatment is good. Add one-half ounce of formalin to fifteen ounces of distilled water to make the solution. Then add one teaspoonful of this mixture to each pint of milk that is fed. This method is very effective.

MODEL DAIRY ON WHEELS.

A tour embracing fifty-three towns and cities along the Southern, K. & A., K. & B., and V. & S. W. Railways, in East Tennessee and Virginia, has been arranged for the Southern Railway's "Dairy Instruction Car," commencing March 20 and lasting through May 21.

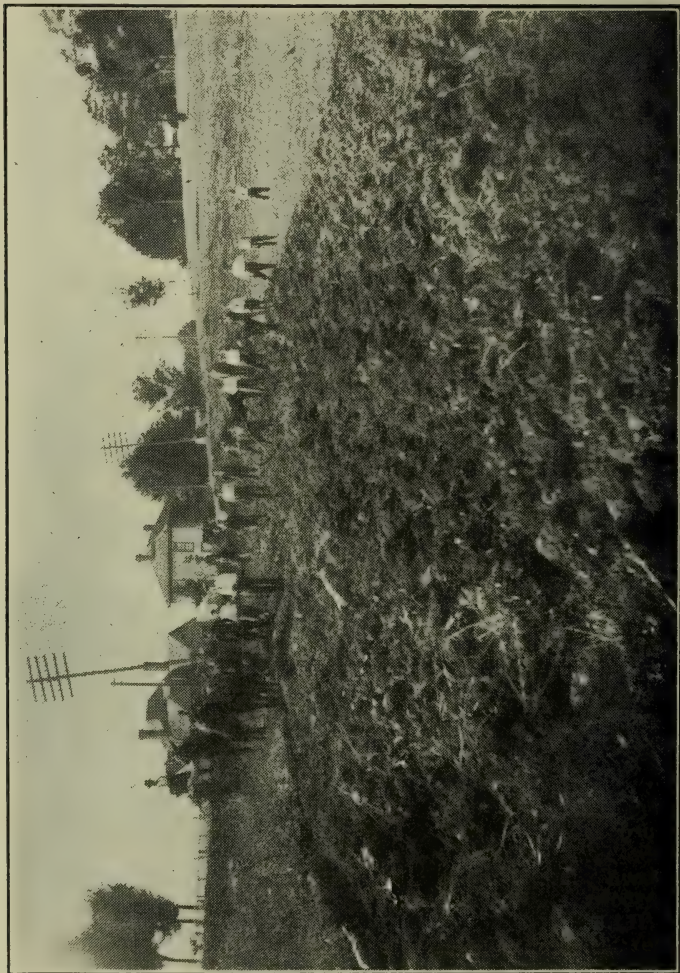
The car is fitted out as a model farm dairy, and during this tour will be accompanied by expert dairymen and cattle breeding specialists representing the railways and the state and federal departments of agriculture, who will conduct lectures and demonstrations showing just how a dairy can be conducted so as to yield steady and substantial profits.

Practically an entire day will be devoted to each of the following stops in upper East Tennessee, with from two to three meetings conducted in the morning and afternoon:

April 18, Straw Plains; April 19, New Market; April 21, Jefferson City; April 22, Newport; April 23, Leadvale; April 24, White Pine; April 25, Rutledge; April 26, Tate Station; April 28, Morristown; April 29, Bulls Gap; April 30, Mosheim; May 1, Greeneville; May 12, Rogersville.

FAIR DATES FOR 1913.

Postoffice.	County.	Dates.	Secretary.
Alexandria	DeKalb	Sept. 4-6	Rob Roy.
Athens	McMinn	Oct. 21-24	W. T. Roberts.
Coal Creek	Anderson	Sept. 23-25	W. L. Wilson.
Concord	Knox	Sept. 9-12	F. H. Boring.
Cookeville	Putnam	Aug. 28-30	A. P. Barnes.
Columbia	Maury		H. W. Thomas.
Deer Lodge	Morgan	Sept. 23-26	T. F. Hayworth.
Fayetteville	Lincoln	Aug. 27-29	F. M. Bledsoe.
Gallatin	Sumner	Aug. 28-30	W. Y. Allen.
Humboldt	Gibson	Sept. 17-20	C. W. Rooks.
Jackson	Madison	Sept. 30-Oct. 4 ..	W. F. Barry.
Kingston	Roane	Sept. 30-Oct. 3 ..	S. R. Sparks.
Lewisburg	Marshall		C. C. Wallace.
Memphis	Shelby	Sept. 22-27	F. D. Fuller.
Morristown	Hamblen	Sept. 3-5	C. B. Weesner.
Murfreesboro	Rutherford		B. B. Kerr.
NASHVILLE			
(State)	Davidson	Sept. 29-Oct. 4 ..	J. W. Russwurm.
Newport	Cocke	Aug. 26-28	Jno. M. Jones.
Paris	Henry	Oct. 8-11	R. H. Hudson.
Rhea Springs	Rhea	Oct. 6-11	H. B. Payne.
Rome	Smith	Aug. 14-16	A. T. Williams.
Selmer	McNairy	Oct. 14-17	W. K. Abernathy.
So. Pittsburg	Marion	Oct. 14-17	W. H. Wilson.
Spring City	Rhea	Oct. 7-11	J. W. Fischesser.
Sweetwater	Monroe	Sept. 16-19	Jas. R. Love.
Tullahoma	Coffee		John W. Harton.
Union City	Obion	Sept. 10-14	J. W. Woosley.
Winchester	Franklin	Sept. 2-5	T. B. Anderton.



Prof. Chas. L. Orth and his Class in Farm Work—McMinn County High School.

MARCH CROP REPORT.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., April 1, 1913.**

Reports from crop correspondents in seventy-nine of the ninety-six counties of the State have been received by the Department of Agriculture and indicate, with the exception of damage done by wind and flood in several sections of the State, an auspicious beginning of the crop year.

Wheat is reported as looking very promising in all sections. Alfalfa is reported in good condition, as is clover and meadow grasses.

From present indications there will be an increase in the acreage in corn over last year.

The recent cold snap has done little, if any, damage to the peach crop, and the prospects now are, without further killing frosts, for a good crop.

Live stock is reported in good condition, with the exception of hogs. Hog cholera is still prevalent in the State, and has done a vast amount of damage.

No crop report was issued for March, 1912, and therefore no comparison is offered. Taking 100 as a normal crop, the following figures are compiled from the reports of correspondents:

Wheat, condition.....	85
Garden, condition.....	80
Oats, condition.....	85
Young clover, condition.....	71
Meadow grasses, condition.....	86
Corn, acreage (estimated).....	93
Tobacco, acreage.....	83
Apples, condition.....	82
Peaches, condition.....	76
Grapes, condition.....	85
Early Irish potatoes, acreage (estimated).....	89
Tomatoes, acreage (estimated).....	91
Live stock, condition.....	89
Alfalfa, condition.....	85

E Highland Rim of Middle Tennessee, Western Subdivision.	Montgomery	90	80	100	100	90	100	90	25	90	100
	Robertson	90	75	80	95	90	100	90	85	90	90
	Cheatham	90	85	90	90	85	95	95	85	95	90
	Hickson	90	80	85	85	85	70	65	60	85	75
	Hickman	90	80	75	85	85	70	65	65	85	85
	Lewis	90	80	85	85	85	70	65	60	85	85
	Wayne	85	100	85	85	100	100	65	100	100	100
	Lawrence	85	80	80	85	100	100	65	100	100	65
	Macon	80	85	85	80	95	90	85	80	95	95
	Clay	80	100	100	80	80	90	55	55	95	100
F Highland Rim of Middle Tennessee, Eastern Subdivision.	Pickett	90	60	90	85	95	90	55	55	95	90
	Overton	90	80	90	85	95	90	55	55	95	90
	Jackson	80	90	95	95	60	40	50	85	95	80
	Putnam	80	90	95	60	85	60	40	50	95	80
	DeKalb	95	85	90	95	95	85	65	65	100	95
	White	80	85	85	80	95	90	90	90	85	90
	Warren	90	80	85	85	70	95	100	75	80	85
	Coffee	90	90	95	95	100	95	100	75	80	85
	Franklin	90	90	95	95	100	95	100	75	80	85
	Sumner	90	85	80	90	90	95	90	85	95	85
G Central Basin.	Trousdale	85	85	95	85	95	100	90	85	85	95
	Smith	100	50	50	80	80	90	40	40	50	100
	Davidson	90	45	80	75	75	75	40	40	50	100
	Wilson	85	65	95	95	75	100	100	90	90	80
	Williamson	80	75	90	90	85	100	100	90	90	85
	Rutherford	90	70	65	70	55	75	100	100	75	75
	Cannon	95	95	95	85	85	95	90	80	100	80
	Maury	75	85	95	50	100	80	80	100	95	85
	Marshall	85	90	90	95	95	75	75	50	100	85
	Bedford	70	60	80	80	70	90	75	50	100	90
H Cumberland and Tableland.	Giles	90	90	85	80	95	100	90	70	80	90
	Lincoln	95	95	95	75	100	100	75	75	100	100
	Moore	95	95	95	75	100	100	75	75	100	100
	Scott	85	90	85	80	100	90	60	60	90	100
	Fentress	85	90	85	80	100	90	60	60	90	100
	Morgan	80	75	80	80	80	90	60	60	90	100
	Cumberland	80	75	80	80	80	90	60	60	90	100
	Van Buren	80	75	80	80	80	90	60	60	90	100
	Grundy	80	75	80	80	80	90	60	60	90	100
	Scott	85	90	85	80	100	90	60	60	90	100

MARCH CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY	Wheat—condition.	Garden—condition.	Oats—condition.	Young Clover—condition.	Meadow Grasses—condition.	Corn—acreage (estimated).	Tobacco—acreage (estimated).	Apples—condition.	Peaches—condition.	Grapes—condition.	Early Irish Potatoes—acreage (estimated).	Tomatoes—acreage (estimated).	Live Stock—condition.	Alfalfa—condition.
J Cumberland Table-land and Valley of East Tennessee.	Claiborne	90	85	85	85	80	100	75	75	100	100	60	100	95	75
	Campbell	90	80	80	80	95	95	75	80	75	100	85	100	95	95
	Anderson	85	80	85	65	75	90	60	60	60	80	90	90	80	80
	Bhea	80	80	85	80	75	100	100	100	25	100	100	100	90	80
	Bledsoe	90	35	85	80	100	85	100	100	100	100	100	100	90	80
	Sequatchie	75	80	90	80	85	80	50	50	75	100	80	70	90	90
	Marion	85	80	90	85	85	80	100	100	100	100	80	70	90	90
	Hamilton	85	80	90	85	85	80	100	100	100	100	80	70	90	90
	Sullivan	85	80	90	85	85	80	100	100	100	100	80	70	90	90
	Hawkins	80	80	75	90	90	100	100	100	100	100	95	90	100	100
K East Tennessee Valley.	Hancock	100	90	100	95	95	100	95	95	95	95	100	100	95	95
	Washington	90	90	90	95	95	100	90	90	90	90	100	100	90	100
	Hamblen	85	80	80	95	95	90	90	90	85	100	95	100	95	95
	Granger	80	80	50	90	90	100	100	100	100	100	100	100	100	100
	Union	80	80	50	90	90	100	100	100	100	100	100	100	100	100
	Jefferson	70	75	75	45	85	60	75	75	100	100	60	100	100	75
	Knox	75	75	75	45	85	60	75	75	100	100	60	100	100	75
	Roane	75	75	75	45	85	60	75	75	100	100	60	100	100	75
	London	90	85	70	65	85	100	100	100	100	100	75	100	100	100
	McMinn	90	85	70	65	85	100	100	100	100	100	75	100	100	100
L Valley of East Tennessee and Unaka Region.	Meigs	90	80	80	85	85	75	100	80	75	90	100	100	100	100
	Bradley	90	80	80	50	50	75	100	80	80	90	100	100	100	100
	James	95	85	90	85	95	95	100	85	90	100	80	75	100	75
	Johnson	95	85	90	85	95	95	100	90	80	100	80	75	100	75
	Carter	95	40	100	95	80	100	100	90	80	95	95	100	90	80
	Unicoi	95	95	90	75	80	95	90	90	80	90	90	85	85	70
	Greene	90	90	85	90	90	95	100	85	80	90	90	100	90	90
	Coke	85	85	85	85	90	85	100	85	55	90	90	85	85	95
	Sevier	90	90	90	85	90	85	100	85	55	90	90	85	85	95
	Blount	80	90	95	85	90	90	100	85	80	90	80	95	85	95
State average	Monroe	80	90	90	85	95	85	60	80	60	40	85	100	100	90
	Polk	70	80	65	60	95	85	60	80	60	40	85	100	100	90
	State average	85	80	85	71	86	93	83	82	76	85	89	91	89	85

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IN THIS ISSUE:

Program of East Tennessee Farmers' Convention
at Knoxville.

Scientific Farming. Farmers Urged to Raise More Beef Cattle.

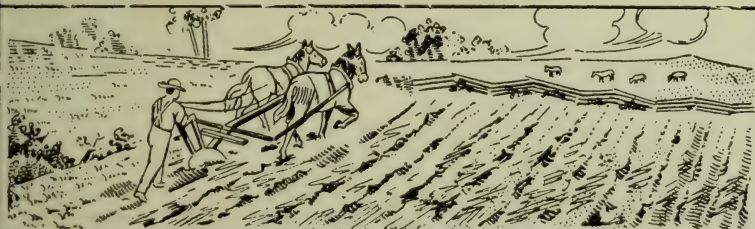
Transferring in Bee-Keeping.

Warning Against Fake Hog-Cholera Serums.

State Chemical Laboratory.

Fruit and Vegetable Growers' Associations in Tennessee.

April Crop Report.



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EAST TENNESSEE FARMERS.

Program of Convention to be Held at Knoxville May 20-22.

The East Tennessee Farmers' Convention and Institute for 1913 will be held at Temple Hall, Experiment Station farm, Knoxville, May 20, 21 and 22.

An interesting three days' program has been arranged as follows:

TUESDAY, MAY 20.**MORNING SESSION.**

- 10:30 Call to order by the President, W. B. Stokely, Dandridge.
Devotional exercises. Federation of Churches of Knoxville
- 10:45 President's Address. W. B. Stokely.
- 11:15 Address. Hon. T. F. Peck, Commissioner of Agriculture,
Nashville.
- 12:00 Appointment of committees. Announcements.

AFTERNOON SESSION.

- 1:00 The kind of education that will help solve rural problems.
Prof. E. S. Richardson, College of Agriculture, Louisiana
State University, Baton Rouge, La.; T. J. Coates, Rural
School Inspector, Frankfort, Ky.
- Discussion—(a) The relation of rural education to the farm.
Prof. J. W. Brister, State Superintendent of Public In-
struction, Nashville.
- (b) The relation of rural education to the farm home. Mrs.
J. A. Reagan, President Home-makers' Section, Sweet-
water.
- 3:00 Getting and maintaining stands of clover and grasses. C. A.
Mooers, Tennessee Experiment Station.
Discussion.
- 4:30 The Convention's method of getting red clover. (Outline of
method to be sent to interested delegates, and reports
expected in 1914.)
- 5:30 Visit to the Experiment Station farm.



Temple Hall, Experiment Station Farm.

EVENING SESSION.

7:30 Short discussions by men and women of the farm on the following topics:

Deep and shallow plowing.

Liming.

Rotations.

Farm poultry.

Winter cover crops.

Drainage.

Proper time to apply farmyard manure.

Economical application of fertilizers.

High production of corn and grains.

Legumes in building soil.

The type of live stock for the average farm.

Farmers' cooperative clubs.

Home conveniences.

Silo construction.

WEDNESDAY, MAY 21.

MORNING SESSION.

(Sectional Meetings.)

AFTERNOON SESSION.

12:45 University of Tennessee Octet.

- 1:00 Address. President W. W. Finley, of the Southern Railway Co., Washington, D. C.
- 2:00 Alfalfa symposium. Joe E. Wing, Mechanicsburg, Ohio; P. G. Holden, Chicago, Ill.; O. P. R. Fox, Morristown; Geo. H. Pepper, Johnson City; J. W. Fisher, Newport.
- Discussion by the 250 farmers in East Tennessee growing alfalfa.
- The Convention's method of getting alfalfa. (Outline of method to be sent to interested delegates, and reports expected in 1914.)
- 4:30 The business of the farmer. Clarendon Davis, Huntsville, Ala. Discussion, led by Phil S. Taylor, Jonesboro.

EVENING SESSION.

- 7:15 University of Tennessee Glee Club.
- 7:30 The country minister's opportunity to assist in the solution of the rural problems. Rev. George R. Stuart, Knoxville.
- Rural life conference. Prof. E. S. Richardson, Baton Rouge, La.; T. J. Coates, Frankfort, Ky.; Prof. Harry Clark, University of Tennessee; Miss Virginia P. Moore, School Improvement Organizer, Nashville.

THURSDAY, MAY 22.

MORNING SESSION.

(Sectional Meetings.)

AFTERNOON SESSION.

- 1:00 Reports of committees. Election of officers.
- 3:00 Adjournment.

GENERAL FARM AND LIVE STOCK SECTION.

TEMPLE HALL.

WEDNESDAY, MAY 21.

MORNING SESSION.

- 9:00 Common diseases of sheep and cattle, and how to control them. Dr. Geo. R. White, State Veterinarian.
- Discussion.

- 10:00 Results of recent experiments in the stall and pasture feeding of beef cattle. Prof. Dan T. Gray, College of Agriculture, West Raleigh, N. C.
Discussion.
- 11:15 Tennessee's feed and seed laws. A. L. Garrison, Chief Feed and Seed Inspector, Nashville.

THURSDAY, MAY 22.

MORNING SESSION.

- 9:00 Horses and mules: Address. Wayne Dinsmore, Secretary Percheron Society of America, Chicago, Ill.
Experiences with draft mares. Prof. Milton Jarnagin, State College of Agriculture, Athens, Ga.
Discussion, led by Garrick Shanks, Limestone.
- 10:00 Profitable lamb production in Tennessee. J. E. Hite, Gallatin.
- 11:00 Hog pastures and hogging-off crops. Prof. C. A. Willson, University of Tennessee; Dr. J. I. Huggins, Oakgrove.

DAIRY SECTION.

IMPLEMENT BUILDING.

WEDNESDAY, MAY 21.

MORNING SESSION.

- 9:00 Dairy management. Dr. C. M. Morgan, Dairy Agent, Southern Railway, Washington, D. C.
Discussion.
- 10:00 Cow-testing associations. Helmer Rabild, Dairy Division, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.
Discussion.
- 11:00 Relation of feed to production of dairy cows. Prof. C. A. Willson.
Discussion.

THURSDAY, MAY 22.

MORNING SESSION.

- 9:00 Milk production per acre. C. A. Hutton, Friendsville.
- 9:45 How to make a cheap, durable silo. H. N. Camp, Jr., Knoxville.

- 10:30 Calves and hogs as dairy by-products. Chas. J. Beal, Rogersville; S. O. Montgomery, Greenback.

AFTERNOON SESSION.

(See General Program.)

HORTICULTURAL SECTION.

WEDNESDAY, MAY 21.

MORNING SESSION.

(In the Plot Barn.)

- 9:00 Waste of large farm gardens. R. T. DeBerry, Assistant Commissioner of Agriculture, Humboldt.
Discussion, led by C. B. Flanery, Knoxville.
Sweet potato: Culture and storage. W. R. Hawk, President Madison County Truck Growers' Association, Jackson.
Tomato as a canner's crop. W. T. Moore, Cleveland.
Record of an onion crop. Frank Jarnagin, Jefferson City.
Asparagus. D. W. Hunter, Chattanooga.
Trucking as a side line in farming. S. R. Ogden, Concord.

THURSDAY, MAY 22.

MORNING SESSION.

(At the University Fruit Farm.)

- 9:00 Summer-pruning the peach. Prof. C. A. Keffer, University of Tennessee.
Demonstration of orchard spraying with power and hand machines. Prof. G. M. Bentley, State Entomologist and Plant Pathologist, Knoxville.

HOME-MAKERS' SECTION.

TENNESSEE HALL.

TUESDAY, MAY 20.

(The ladies will join with the men in the general session the first day.)

WEDNESDAY, MAY 21.

MORNING SESSION.

- 9:00 Opening talk. Mrs. James A. Reagan, President.

- 9:30 What is the best method of getting home-making in public schools and rural communities? Miss Marie Willoughby, U. S. Department of Agriculture, Washington, D. C.
Discussion by members.
- 10:30 The prevention of disease among children. Dr. Olin West, Assistant Secretary State Board of Health, Nashville.
Lunch, served by Home Economics Department, University of Tennessee.

THURSDAY, MAY 22.

MORNING SESSION.

- 9:00 The minimum equipment for teaching home-making in rural districts. Miss Melissa Byrd, Tasso.
Discussion by members.
Labor-saving devices for the home. Miss Louise Turner.
Discussion by the members.

BOYS' CORN CLUB SECTION.

In charge of J. R. Fewell, State Corn Club Agent,

SECOND FLOOR OF BARN NO. I.

WEDNESDAY, MAY 21.

MORNING SESSION.

- 9:30 The Corn Club work and the factors in its development. J. R. Fewell, Assistant State Agent, in charge of Boys' Corn Club work, Nashville.
- 10:15 Why the Corn Club boys should be land-builders. Clarendon Davis, Huntsville, Ala.
- 11:00 How a Corn Club boy went to college. Prof. Harry Clark, University of Tennessee.

AFTERNOON SESSION.

- 2:00 How to increase the yields of corn. J. A. Dinwiddie, New Market.
- 2:30 Proper cultivation of corn. C. F. Striplin, Government Demonstration Agent, Maryville.
- 3:00 Score-card judging of corn by the boys. Prof. J. C. Pridmore, University of Tennessee.
- 3:30 Excursion over the Experiment Station farm.

SCIENTIFIC FARMING.

BY T. F. PECK, COMMISSIONER OF AGRICULTURE.



I want to talk to you about scientific farming, and I hope to convince you that many of you have held the wrong idea about it. Many of you have the notion that scientific farming is only possible for the rich or those who have had the advantage of a technical education in agriculture, and because of that notion on your part you have turned your back on the whole proposition as being impractical to you. As a consequence you have made very little effort to profit by what came to your notice in scien-

tific agriculture.

To you farmers who have thought that way about the matter I want to say that some of the most scientific farmers I ever knew were men who had very limited educational advantages; they were men who thought about their work, men who reasoned for themselves, men who kept their eyes open and profited by what was going on around them.

If a farmer in the neighborhood made a success with any crop, such a man would find out all about how the ground was prepared for that crop, the kind of seed and method of cultivation and compare with his method. He would try that out on his farm and if his results were better there was a bit of scientific agriculture he had learned, and it is just in this way that our fund of knowledge of scientific agriculture has been accumulated, much by farmers as I have described profiting by others' experience, adopting that which helped them and avoiding mistakes made by neighbors.

Much more has been learned about scientific agriculture by the experiment stations which have men working on all the problems the farmer has to contend with; they keep working until they get the facts. The farmer of today can get the facts; it is up to him to take them and give them practical application on his farm. Some farmers have learned where to get the information and how to put it to practical use, but too many have not. They simply have been trying to farm with the same methods their fathers used, and they find it a

harder proposition every year and will continue to do so. They are making their land poorer and their crops are smaller and will continue so.

Conditions are different now. Their fathers had fertile land, but they reduced its fertility by their methods. They did not notice it much in their time; if they did they could clear up additional land and let that worn-out go; but that day has passed. We have no more virgin land to clear. We must build up and make rich that we have. We can do it. Others have done so.

We are passing through a period that farmers in older countries have passed through. Their farmers, by poor method, depleted their soils, their production decreased and their population increased; they had their choice—improve their soils or go hungry. God gave them minds to think and when hunger and starvation began to stare them in the face they began to think about their work. They increased their crops. Their land increased in fertility and has been increasing since they woke up to the fact that their soils were their capital and made them a profit just in proportion to the intelligent attention given them.

Land in Germany that has been in constant cultivation for hundreds of years is producing better than ours. We have to learn the same lessons, and experience is going to be our best teacher and common sense our best text book. We have a decided advantage over the farmers in the old countries who have restored their land to fertility. They had no experiment stations to solve their problems for them. You have. There is an abundance of facts proven for the farmers touching every phase of farming. Our problem is to get this information to the farmers and get them to put it in practice.

The fault is not altogether with the farmers that they are not getting the benefit of it that they should. Some people engaged in agricultural educational work take it for granted that all farmers are in position to understand and put in practice their teachings when given in technical terms, simple enough for those who have technical education, but almost entirely out of the reach of the farmer without education, and for that reason most of the efforts of the technical teachers in scientific agriculture have gone over the heads of the people intended to be benefited. There is no good reason for this. The information can be given in simple, plain language that any farmer can understand; then we can aid the farmer most by practical demonstration, provided the demonstration is along lines that he can follow; otherwise it is liable to discourage rather than encourage the farmer.

Any farmer, if asked, would say that the doctor who attends his family when sick should study his profession, and they would not employ him if they did not think he kept posted in his profession. They would not employ a lawyer if they did not think he was skilled in the law. They would expect the merchant to fail if he did not understand his business, and the farmer when he knows that he is losing ground is content to drift, to cling to old methods when better ones are within his reach, and if put in practice would build up his soil, increase his profits, give him more of the comforts and conveniences of life for himself and family.

I want to see him wake up and make the most of his opportunities. They are greater than ever before. His markets are better; his natural advantages of climate, rainfall and variety of soil give him every chance to make good if he will put his mind and his hands to work and build up his soil. The Department of Agriculture has been trying to help him by publishing information that he can understand on subjects that affect him in rebuilding the soil, in the cultivation of crops, in raising live stock. We have tried to reach him in farmers' institutes and with the Agricultural Special when we had displayed exhibits of crops and live stock and lectures on every phase of farming. The newspapers of the State have been liberal in space, the railroads have been liberal to carry exhibits and lecturers.

Brother farmer, the information is yours if you will take it; the benefits will be yours if you do. Let me urge you to make the most of the opportunity now knocking at your door. I want you to prove that you have the capacity to grasp the opportunities while they offer.

GOOD PROFITS IN POPCORN.

With popcorn so popular an article of consumption as it is, there is no farm in any section of the corn belt that should not grow a patch to supply the family needs. Popcorn will do well on any land that will produce a good crop of corn.

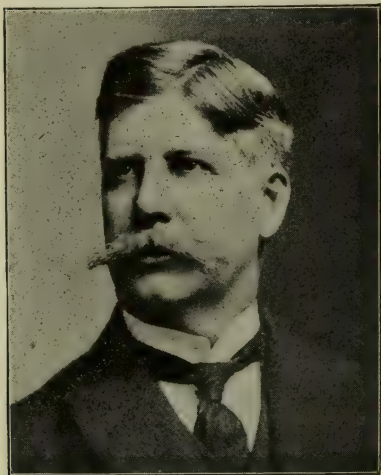
It should be cultivated and cared for in the same general manner as corn, though it may be planted more closely. It ripens in about 100 days, and it should be shocked as soon as it is ripe, so that it will dry out well before husking. It will produce from fifty to sixty bushels of ears with a good stand, and this will fetch from \$1 to \$2 per bushel.

One care of potatoes shipped into Spokane, Wash., containing 300 crates of the earlies, sold for \$1,050. Another car shipped about July 8th sold for the same amount.

FARMERS URGED TO RAISE MORE BEEF CATTLE.

Address Issued by Judge Robert Ewing, Chairman Agricultural Committee, Nashville Board of Trade.

To the Farmers and Stock Raisers of Tennessee:



GENTLEMEN: When, for any reason, an undesirable condition in any line of important business has been brought about, the true cause of the trouble should be immediately and clearly ascertained. If it admits of a remedy, this should be promptly and vigorously applied, especially if the business be one in which the public has serious concern.

Unhappily, it is not a matter of news to say that beef is high in price. In fact, the best kinds are almost out of reach of the main body of the purchasing public. Any man who goes to market to buy a good steak or roast knows this to be the case. It was not so once, and should not be so now. Purchasers feel keenly the deprivation of such desirable things.

What is the real reason for this condition? Can the situation be improved, particularly in Tennessee?

REAL CONDITIONS.

Many reasons for the condition are assigned. It is altogether probable that each one of these contributes something toward it. Confessedly, the population is increasing; the means for the distribution of farm products over the country are better; many good things, including fat cattle, therefore, cannot now be kept at home; laborers are flocking to the cities; they are scarce and hard to secure for farm work; the price they demand for their labor is high; meat packers do, perhaps, combine and the retailer, alleging that everyone of these troubles lights on him, may stick his own coultter a little too deep. But, after all, the real, basic reason is a shortage of supply of beef cattle. As long as this shortage continues conditions are not going to change appreciably for the better. If such a change can be brought about it should be, for though vegetarians may claim that too much meat is eaten, the general run of sensible people differ with

them. These latter are of the opinion that good, juicy beef constitutes good, healthy food, necessary for strength, and that the people of a State like Tennessee ought to be able to get it. That they may, they should take the necessary steps to increase the supply and put it in the power of all to purchase a good article in the market at a somewhat more reasonable price.

The Agricultural Committee of the Board of Trade, on a number of occasions, has undertaken to explain how the present shortage came about. To repeat briefly this explanation would be to say that the farmers of the Central West, twenty-five or thirty years ago, discouraged by the free grazing to be had in the far West, and therefore unable, as they mistakenly supposed, to compete, practically ceased to raise beef cattle. Since then these free-grazed cattle have constituted the supply of beef for the country. Rather suddenly that free grazing has become a thing of the past. Its sudden cessation catches the farmers of the Central West, as well as those of other sections of the country, almost bare of stock, and very naturally a shortage is the result.

But we can't afford to do without beef, and plenty of it. These farmers will simply have to return to cattle raising. There is no escape. They recognize the necessity and have already resumed. Time sufficient, however, to make any great impression has not yet elapsed, partly because the actual stock for beginning purposes has been reduced so low, and partly because the price constantly being offered, even for these, is so high that the temptation to sell is hard to resist. But it will have to be resisted and other sensible things, aiding resumption, will have to be done, one of which is the putting of an immediate stop to the unwise practice of slaughtering female calves. Veal is a luxury which, in part, for the present at least, should be done without.

Now that the business over the country at large has to be practically begun again, it should be started on better lines than used to prevail, particularly in the South. It is just as cheap in the end, and a far better business, to raise cattle of good quality as those of the scrubby and very undesirable kind so often to be seen in some of the Southern States. The good ones eat no more and give a far better return on what they do eat.

PROPER BREEDS.

Of course, in this section of the country, dairy interests will have to be still further encouraged. No one can wisely question this fact. The dairy cow certainly answers one great purpose, but admittedly

the Jersey, the popular butter cow, is of very little value as a beef producer. While milk and butter are good, and perhaps necessary things, beef is of equal, if not more importance, and under existing circumstances a breed of cattle as well calculated for producing beef as the Jersey is for producing butter will also have to be more generally raised, if present unsatisfactory conditions are to be bettered.

Are Tennesseans going to engage more strongly in the raising of beef cattle? There is every reason why they should. Few can pay the price now demanded for good beef. A splendid market is certain to continue for many years to come. Cattle hides even are going up, up, up, and consumers of leather are beginning to wonder where the supply of leather for shoes and automobiles is to come from. Any observer knows that the price of shoes is rapidly advancing, and that inferior material is being used in their make which should not be used if the price of leather were not so high. Are not shoes something which we cannot do without?

The increasing cost of shoes is due, in great part, to the enormous consumption of leather by the manufacturers of automobiles. This has grown in astounding proportions. One popular company claims that 400,000 hides will be required to meet its demand alone this year. When it is considered that automobiles have come to stay, and that this is the estimated requirement of one company for one year, and when it is also remembered how many auto manufacturing companies there are and that so far leather is the best, if not the only satisfactory material, for upholstering these cars, it is no guess to say that the price of hides is sure to advance still more.

Large quantities of leather will also continue to be used for all kinds of harness material and for covering furniture.

SOIL OF TENNESSEE.

Is not the soil of Tennessee suitable for producing the best of grazing grasses, which last throughout a good part of the year? Will it not also produce in abundance all other kinds of cattle feed-stuffs? Is not the climate also adapted to cattle raising? Is not the water pure and plentiful? Is not the Agricultural Department of the State vigorously and most successfully eradicating the cattle tick from the few counties which suffered from this insect? Is not the closest attention also being paid by this department to the stamping out of every sort of disease which afflicts cattle? Surely no one can read the report recently issued by the department and fail to observe how successfully these things are being accomplished. Does not cattle

raising help to keep the soil fertile? Everyone knows that it does, and how very important it is that this should be done. It is a recognized fact that the soil in those States which, for the past twenty-five years, have ceased to produce cattle has very sensibly depreciated in productivity, and that expensive, artificial fertilizers now have to be resorted to to restore that fertility. There can be no sort of question but that this deterioration of the soil is attributable to the failure to maintain cattle. A wiser course would have been to have kept the cattle and fed them the products of the farm, for the increased flesh of these cattle would have been the best market obtainable for these feedstuffs. So that this failure to raise cattle has hurt seriously, in at least two ways, viz.: in the increased price of the best food, and in the lessening of the productivity of the soil.

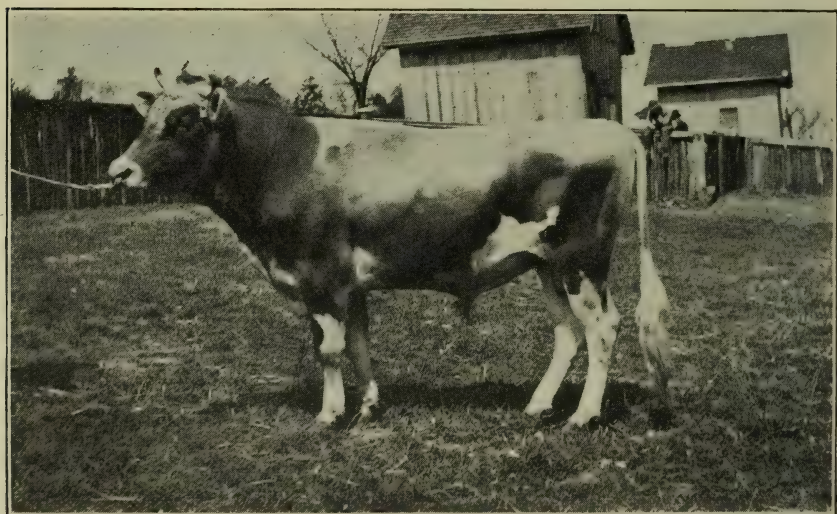
PECULIARLY ADAPTED.

Tennessee, because of its peculiar adaptability to the raising of fine beef cattle, should not only set adjoining States a good example by strongly engaging in the business, but should make itself of great assistance to them by becoming, so to speak, a nursery for well-bred young cattle, a place to which other States, not so favored, could look with the certainty of being able to obtain here well-bred individuals of the beef-producing breeds, such as the Aberdeen Angus, the Hereford, and the Shorthorn, to serve as leaders, and improvers of their herds. A thorough concert of action among raisers should obtain. Organizations to this end should be formed which would cover all questions of interest to and connected with the business. These would naturally include the joint purchase of good sires; the teaching of the best methods of breeding and how best to care for the stock; the utilization of foods which are not now fully availed of; the holding of joint auction sales, well advertised, sales where well-bred young sires and dams could be had at such figures as would be attractive to purchasers and satisfactorily remunerative to raisers; joint action in securing the cooperation of railroads in helping to build up the business by every reasonable means within their power, under existing laws.

Such help will prove highly valuable. The railroads of the State are alive to the importance of the question and will be found ready to do their part. The fact is, they are doing it now. Not long since the newspapers described a joint auction sale held by some of the wide-awake stock raisers of Madison County. The 250 head sold brought \$16,000, or an average of \$62 a head. Inquiry developed

the fact that the Industrial Department of the N., C. & St. L. Railway had done much to make this sale a success. In the assistance rendered in bringing such sales about, thus serving the interest of the purchaser away, as well as the raiser at home; in granting very low rates on cattle carried to these sales and shipped away, and also like low rates to individuals attending, and in many other ways favoring the interest, this road is certainly doing a wise thing. Investigation on the part of those contemplating engaging in the business will convince them that all of the roads of the State are ready to stand behind them in any reasonable way because of the plain fact that it is to their interest to do so.

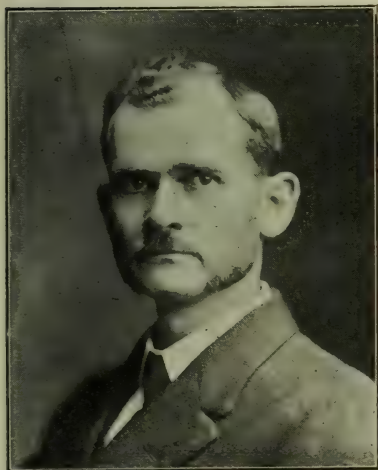
In a word, the great shortage of beef cattle now existing, the absolute sureness of a continuing demand at good prices, the suitability of the soil and climate and many other favoring features seem to call loudly for a more vigorous prosecution of this business in Tennessee. Nearly every State in the South is peculiarly favored in some one particular. The adaptability for cattle raising is one of the things wherein Tennessee is favored. Its citizens should not fail to avail themselves of it. Properly pursued, the business cannot fail to be profitable. There is no reason why Tennessee should not hold a place in the very front rank, and it will do so if all advantages are taken of the situation.



Two-year-old Imported Bull, Vesta's Knight, out of Vesta's Daisy, Gold Medal Cow with Largest Butter Test ever made on Island of Jersey. The Sire and Dam of this Bull Brought at Public Auction in America, \$11,250.00. Property of May Overton, Travelers' Rest Farm.

TRANSFERRING IN BEE-KEEPING.

BY DR. J. S. WARD, STATE INSPECTOR OF APIARIES.



As spring approaches every bee-keeper should be making his preparations for the honey harvest. Extra hives should be purchased, nailed together and painted, ready for the swarms as they come off. All frames should be wired and filled with full sheets of foundation. See that the smoker is in good repair, and that the bee veil has no holes in it. Don't wait until the honey flow is on and the swarms are coming off before you wake up and find yourself not ready. Such neglect will mean the loss of

swarms, honey, dollars and interest in a most profitable industry.

All the hives should be gone into and carefully examined. See that each one has a good queen, whose wings are clipped and that there is plenty of stores to care for the brood during the early spring weeks. Should the stores be exhausted or light, feed a thin syrup of sugar and water two or three times weekly.

But of all work in the early spring there is none of more importance than the transferring of all swarms or colonies from the old-fashioned hive or "gums" to the modern movable-frame hive. Don't try to keep bees in the old "gums." They are not only unprofitable, but a positive menace to aggressive bee-keeping. They are harboring places for moths and the foul brood diseases. They are unsightly and prevent that hive manipulation that is necessary for the best honey harvest. I know that good honey is sometimes obtained from these home-made boxes, but oftener it is black honey, mixed with bee bread, worms (lava) and dead bees. Who wants the mixture? For it there is no market, and the bees themselves are usually left so disturbed, robbed and depleted in stores and brood that they either perish or do no good. In a great majority of instances you get nothing at all, and not being able to look into the hives to give them intelligent attention, the bees finally die. Who is to blame for all of this but the careless, indifferent, old-fashioned bee-keeper? Transfer, Mr. Bee-Keeper, transfer.

There are several methods of transferring; each has its advan-

tages and disadvantages. The master bee-keeper will follow the method that best suits his location, time of the season, kind of box transferring from, etc.

The following method as printed in an old issue of "Gleanings in Bee Culture" is a good all-round method for the novice.

The old-fashioned way was to prize off the side of the box hive, cut out the combs and fit them after a fashion into the brood frames. This takes a great deal of time, and at best it is a sticky, mussy job, to say nothing of the mashed up bees and stings and finally the result is a lot of patched up, crooked combs. The combs in box hives are usually so crooked, so old and contain so many drone cells that it will be money in the pocket to purchase brood foundations, fasten it into frames on wires ready to receive the transferred colony.

We will assume that your hive, or hives, have been received in the flat and put together and painted and contain frames of wired foundation, ready for the bees. Light your smoker and put on your bee veil. Move the old hive back four or five feet and put the new one in its place. Prepare a small box about eight inches deep and one side open, that will just cover (not slip over) the bottom of the box hive. Turn it upside down, set the hiving box over it and then drum on the sides of the hive with a couple of sticks until about two-thirds of the bees pass up into the box. Gently lift off the box containing the bees and dump it in front of the entrance of the new hive. Make sure that the queen is among them by watching her as she passes with the rest into the entrance. If you do not discover her, look inside the hive. If you still fail to find her, drum out bees from the old hive again until you do get her, for, to make the plan a success, she must be in the new hive.

Return to the box hive and turn it right side up and set it down a couple of feet back of the new one with its entrance turned at right angles. You now have in the hive about one-third of the original colony, the comb and all the brood. Allow the old hive to stand for at least twenty-one days, at the end of which time the brood will be hatched out, with the exception of a little drone brood, which will be of no value. Turn the old hive upside down and drum the bees out again into the hiving box. Put an entrance guard of perforated zinc over the entrance of the new hive, smoke the bees of the new hive and then those in the hiving box, after which dump it in front of the entrance of the new hive as before. The smoking is to prevent the fighting on the part of the bees at the second drive and the entrance guard is to catch the queen, or queens, that have

been raised in the meantime in the old hive. These one or two, if virgins, should be caught on the perforated metal and given to some queenly stocks. If the old queen in the new hive is a valuable one, she should be caged at the time of making the second drive. If neither queen (the one in the old hive or the one in the new one) is valuable, the perforated zinc need not be used.

The job of transferring is now completed, and all you have on hand is an old box hive, containing a lot of old crooked combs, with perhaps a little honey and drone comb in it. The honey can be extracted, or used as chunk honey on the table, if fit for use; the rest can be melted up into wax, and the hive itself will make first-class kindling wood, because it is smeared over on the inside with propolis and bits of wax.

All transferring by the novice should be at the beginning of or during the honey flow.

BREEDING STOCK FOR DAIRY.

In Selection of Animals Real Test Must Be With Scales and Reliable Babcock Tester.

Prof. W. J. Kennedy of the Iowa station recommends the following in reference to the selection of breeding stock for the dairy:

In selecting dairy cattle the real test must be the scales and the Babcock tester. The cow is a machine to convert food into milk; thus she must have a large middle and a strong constitution to insure the best results. She must also have a large udder, large milk wells, large crooked milk veins and good-sized teats.

Her head should be clean and angular in appearance, with the eyes standing out prominently. The neck should be rather long and lean in appearance; the shoulders pointed and the backbone rather prominent. The skin should be loose and soft to the touch. In selecting herd bulls either mature animals which have already demonstrated their worth as sires or younger animals from high-testing dams and sires only should be used.

The best and surest results will always follow the use of a mature sire which has sired heifers with good records. A good dairy bull should be kept until he is twelve or fifteen years old; in fact, as long as he is a sure sire. Real good sires are so rare that when we do find one he should die only of old age. All breeders of dairy cattle should secure yearly tests on each and every cow in the herd. Shorter tests do not really mean very much. It is the cow that stays by her job that is really valuable.

WARNING AGAINST FAKE HOG-CHOLERA SERUMS AND VACCINES.

BY GEO. R. WHITE, STATE VETERINARIAN.



With the advent of Dorsett-Niles anti-hog-cholera serum about three years ago the most deadly of all swine diseases was doomed to ultimate eradication from the American continent. It is a well-known and fully-established fact that until then the swine owners' investment in hogs was at all times jeopardized by this disastrous disease.

Long ago all well-informed individuals fully realized that every medicinal treatment for hog cholera which had ever been proposed was worse than worthless in "curing" this disease. The swine owners' pocketbooks were continually being depleted and flattened by so-called "hog cholera cures" of all kinds and descriptions, which in reality were nothing more or less than "fakes" and "frauds" compounded for the purpose of wrenching hard-earned dollars from the honest, though gullible, hog owner. The press, agricultural press in particular, carried in each and all issues glaring advertisements of numerous so-called "cures for cholera."

In spite of the large amount of money spent for these "fake remedies," hog cholera continued to spread with cyclone-like rapidity. Since the discovery of the Dorsett-Niles anti-hog-cholera serum and its demonstrated and undisputed efficiency the "fakes" have shifted their advertisements from "medicines" to so-called impotent fake "serums" and "vaccines," for which it behooves the farmers of Tennessee to be on the constant lookout.

The Dorsett-Niles serum, when properly made by reliable and well-trained men, according to the United States Government standards, and by the well-defined technic of Drs. Dorsett and Niles, when properly administered, will undoubtedly protect healthy hogs from cholera. However, the field for fraud and deception is so inviting that the "unscrupulous fakers" have already invaded it with their worthless "juice" in the form of "vaccine" or "serum." Look out for them and refuse to allow them to separate you from your hard-earned dollars.

Remember that the following sections of the Agricultural Department's rules and regulations have for their object the protection of the swine owners of Tennessee from just such fraudulent practices:

"SECTION 19. Before veterinary biological products of any character shall be sold, offered for sale or distributed in any manner in this State, the manufacturer or person, firm or corporation selling or distributing the same shall make application in writing to the State Live Stock Inspector for a permit to sell or distribute said veterinary biological products. Provided, however, that nothing in this section or the following sections shall prohibit or interfere with the United States Department of Agriculture, through its Bureau of Animal Industry, in distributing the veterinary biological products of its laboratories.

"SECTION 20. The term veterinary biological products as used in Section 19 shall be construed to mean tuberculin, mallein, anthrax, vaccine, black leg vaccine, hog cholera serum, tetanus antitoxin, influenza antitoxin, anti-streptococcic serum, rabies vaccine virus and bacterins."

Before purchasing hog cholera serum from anyone, take the precaution of determining whether or not the manufacturer is in possession of a permit from the State Agricultural Department for its sale in Tennessee. Up to May 1, 1913, only three commercial firms have been granted permits to market anti-hog-cholera serum in Tennessee. The names of these firms will be furnished to any resident of Tennessee upon application to the State Veterinarian.

At the present time this State is being flooded with advertisements—by mail and otherwise—of at least thirty commercial firms who have something "attractive"—in price or otherwise—to offer the swine owners for the treatment and prevention of hog cholera. Beware of these and remember that all medicines advertised as "hog cholera cures" are worthless and that 50 per cent of the "serums" and "vaccines" are "frauds" and are sold and distributed in this State in open violation of law.

We are arranging for submitting all the commercial serums now offered for sale in Tennessee to rigid tests to determine their efficiency. As soon as these tests are completed the department will expose all "fakirs" by publishing their names in Tennessee Agriculture and other agricultural papers of the State.

Ewes should be two years old before being bred.

STATE CHEMICAL LABORATORY.

Text of Act Establishing New Branch of Department of Agriculture.



J. W. SAMPLE, State Chemist.

The Fifty-Eighth General Assembly passed an act creating a State Chemical Laboratory under the direction of the Department of Agriculture. Following is the bill as passed:

LABORATORY BILL.

AN ACT to provide for the establishment of a State Chemical Laboratory under the direction of the Commissioner of Agriculture, to provide for the appointment of a State Chemist, define his duties, fix his compensation; provide for an Assistant Chemist and make an appropriation to carry out the provisions of this act.

SECTION 1. *Be it enacted by the General Assembly of the State of Tennessee*, That the Commissioner of Agriculture be, and is, hereby authorized and directed to establish a properly organized and fully equipped chemical laboratory, in which shall be made such examinations and analyses of commercial fertilizers, commercial feeding stuffs, and field and garden seeds offered for sale in Tennessee, and which may be collected from time to time under such rules and regulations as are prescribed, or may be prescribed, by the Commissioner of Agriculture in the administration of the laws governing the sale of such fertilizers, feeds and seeds in this State.

SECTION 2. *Be it further enacted*, That the Commissioner of Agriculture shall appoint, as soon as practicable after the passage of this act, a chemist of established reputation and ability, who shall be known as State Chemist and who shall hold office for a term of two years from date of his appointment. The salary of said chemist shall be eighteen hundred dollars per annum, payable monthly out of the treasury of the State, as are paid the salaries of other State officials.

SECTION 3. *Be it further enacted*, That said chemist shall have and maintain his office in quarters provided by the Superintendent of the Capitol in the capitol or elsewhere in the city of Nashville, as may be deemed advisable or necessary, and said laboratory shall be

equipped by said chemist for proper inspection and analyses of all commercial fertilizers, commercial feeding stuffs and field and garden seeds which may be submitted for inspection and analysis to him by the Department of Agriculture, and shall also be prepared to furnish analyses of soils from samples submitted to him by or through the Department of Agriculture, or by any citizen of Tennessee owning real estate, or who is engaged in agriculture, and many send soil or seed to the State Chemist and have it analyzed.

SECTION 4. *Be it further enacted*, That said State Chemist shall be required to keep a complete record in his office of all such inspections and analyses and shall make an annual report of his work to the Commissioner of Agriculture.

SECTION 5. *Be it further enacted*, That said State Chemist shall be empowered to employ an assistant at such times as may be necessary, provided that assistant shall not be employed for more than four months in any one year.

SECTION 6. *Be it further enacted*, That for the purpose of carrying out the provisions of this act, there is hereby appropriated from the State treasury, out of such moneys as are not otherwise appropriated, the sum of thirty-five hundred dollars per annum for two years, or so much thereof as may be necessary, from the 19th of March, 1913, same to be included in the general appropriation bill.

SECTION 7. *Be it further enacted*, That all the expenses of the office and laboratory of State Chemist shall be paid out of the appropriation hereinbefore provided for on vouchers issued by the Commissioner of Agriculture.

SECTION 8. *Be it further enacted*, That all laws and parts of laws conflicting with this act be, and they are, hereby repealed.

SECTION 9. *Be it further enacted*, That this act take effect from and after its passage, the public welfare requiring it.

Under the provisions of this act, Commissioner Peck has appointed J. W. Sample to the position of State Chemist. Quarters have been secured at 706 Cedar Street, and equipment is now being installed.

Before setting hens are placed upon eggs for hatching the nest should be thoroughly saturated with some one of these preparations to kill any mites that may be present and to forestall immediate infestation. A teaspoonful of the undiluted cresol soap solution placed beneath the straw in the hollows of the nests will keep them free from lice as well as mites, but it should not come in contact with the eggs.

A TRIBUTE TO GRASS.

BY THE LATE SENATOR J. J. INGALLS, OF KANSAS.

"Majestic, fruitful, wondrous plant! The corn, triumphant, with the aid of man hath made victorious procession across the tufted plain and laid foundation for the social excellence that is and is to be.

"The glorious plant, transmuted by the alchemy of God, sustains the warrior in battle, the poet in song and strengthens everywhere the thousand arms that work the purposes of life.

"Next in importance to the divine profusion of water, light and air, those three great physical facts which render existence possible, may be reckoned the universal beneficence of grass.

"Exaggerated by tropical heats and vapors to the gigantic cane congested with its saccharine secretion; or dwarfed by polar rigors to the fibrous hair of northern solitudes, embracing, with its resolute pennons, the rice plant of southern swamps, the wheat, rye, barley, oats and other cereals, no less than the humbler verdure of the hillside, pasture and prairie in the temperate zone, grass is the most widely distributed of all vegetable beings, and is at once the type of our life and the emblem of mortality.

"Lying in the sunshine among the buttercups and the dandelions of May, scarcely higher in intelligence than the minute tenants of the mimic wilderness, our earliest recollections are of grass, and when the fitful fever is ended, and the foolish wrangle of the market and the forum is closed, grass heals over the scar which our descent into the bosom of the earth has made; and the carpet of the infant becomes the blanket of the dead.

"Grass is the forgiveness of nature; her constant benediction. Fields trampled with battle, saturated with blood and torn with the ruts of cannon, grow green again with grass, and carnage is forgotten.

"Streets abandoned by traffic become grass-grown like rural lanes and are obliterated.

"Forests decay, harvests perish, flowers vanish, but grass is immortal. Beleaguered by the sullen hosts of winter, it withdraws into the impregnable fortress of its subterranean vitality and emerges upon the first solicitation of spring.

"Sown by the winds; by the wandering birds; propagated by the subtle horticulture of the elements which are its ministers and servants, it softens the rude outline of the world.

"Its tenacious fibers hold the earth in its place and prevent its soluble components from washing into the wasting sea. It invades

the solitudes of deserts, climbs the inaccessible slopes and forbidding pinnacles of mountains; modifies climates and determines the history, character and destiny of the nations.

"Unobtrusive and patient, it has immortal vigor and aggression. Banished from the thoroughfare and the field, it bides its time to return, and when vigilance is relaxed or the dynasty has perished it silently resumes the throne from which it has been expelled but which it never abdicates.

"It bears no blazonry of bloom to charm the senses with fragrance or splendor, but its homely hue is more enchanting than the lily or the rose.

"It yields no fruit in earth or air, and yet, should its harvest fail for a single year, famine would depopulate the world."

FRUIT AND VEGETABLE GROWERS' ASSOCIATIONS IN TENNESSEE.

Cheatham County Fruit Growers' Association, Ashland City.

Chester County Fruit Growers' Association, Henderson.

Fruit and Vegetable Growers' Association, Gadsden.

Fruitvale Vegetable Growers' Association, Fruitvale.

Gadsden Fruit Growers' Association, Gadsden.

Coffee County Cantaloupe and Vegetable Growers' Association, Summittville.

Davidson County Strawberry Growers' Association, Antioch.

Nashville Strawberry Growers' Association, Joelton.

Farmers' Strawberry Union, Nashville.

Klondyke Strawberry Union, Nashville.

Goodlettsville Berry Union, Nashville.

Gandy Strawberry Growers' Association, Nashville.

Goodlettsville Strawberry Growers' Association, Goodlettsville.

Nashville Strawberry Association, Nashville.

Dickson Cantaloupe Growers' and Truckers' Association, Dickson.

Home Canning Association, Tennessee City.

Van Ker Cantaloupe Association, Van Ker.

Somerville Fruit Growers' Association, Somerville.

Medina Fruit Growers' and Shippers' Association, Medina.

Trenton Fruit Growers' Association, Trenton.

Gibson Fruit Growers' Association, Gibson.

Fruit Growers' Association, Dyer.

Fruit Growers' Association, Cades.

Bradford Fruit Growers' Association, Bradford.
 Knox Berry and Truck Growers' Association, Bearden.
 Knox County Berry and Truck Growers' Association, Knoxville.
 Fruit and Vegetable Growers' Association, Curve.
 Halls Fruit and Vegetable Growers' Association, Halls.
 Ethridge Cantaloupe Growers' Association, Ethridge.
 Lewis County Canning and Vegetable Association, Hohenwald.
 McMinn Fruit and Vegetable Association, Athens.
 McMinn County Strawberry and Vegetable Association, Athens.
 Farmers' Cantaloupe Association, Culleoka.
 Deer Lodge Growers' Association, Deer Lodge.
 Sunbright Truck Growers' Association, Sunbright.
 Union City Truck Growers' Association, Union City.
 Dayton Fruit Growers' Association, Dayton.
 Mutual Berry Growers' Association, Evensville.
 Sheffield Berry Growers' Association, Sheffield.
 Sumner County Fruit and Vegetable Growers' Association; Gallatin.
 Gallatin Fruit Growers' Association, Gallatin.
 Warren County Union Truck Growers' Association, McMinnville.
 Greenfield Fruit Growers' Association, Greenfield.

DOUBLING GRAIN PRODUCTION.

Recent experiments made by James J. Hill led him to say that if farmers will follow his methods they can double the grain production of the Northwest over the figures of 1912, which are very high.

All that is necessary is to put back into the soil the elements that have been taken out of it by previous crops.

There is nothing new in Mr. Hill's ideas. The farmers over in Europe, where close figuring is necessary to live in a land of penury, have known all this for generations. Over there the man who lets his land run down is regarded just the same as a man who lets his bank balance run down without making any effort to put it back.

Land is not a mine from which you can take ore in the shape of soil fertility year after year without apparent diminution of its earning power.

The modern farmer is coming to realize this truth a great deal better than he did. But still there are lots of them who would see \$1,000 subtracted from the value of their soil rather than pay \$10 to an agricultural college expert to find out what the land needs.—*Clarks-ville Leaf-Chronicle*.

FAIR DATES FOR 1913.

Postoffice.	County.	Dates.	Secretary.
Alexandria	DeKalb	Sept. 4-6	Rob Roy.
Athens	McMinn	Oct. 21-24	W. T. Roberts.
Coal Creek	Anderson	Sept. 23-25	W. L. Wilson.
Concord	Knox	Sept. 9-12	F. H. Boring.
Cookeville	Putnam	Aug. 28-30	A. P. Barnes.
Columbia	Maury		H. W. Thomas.
Deer Lodge	Morgan	Sept. 23-26	T. F. Hayworth.
Fayetteville	Lincoln	Aug. 27-29	F. M. Bledsoe.
Gallatin	Sumner	Aug. 28-30	W. Y. Allen.
Humboldt	Gibson	Sept. 17-20	C. W. Rooks.
Jackson	Madison	Sept. 30-Oct. 4 ..	W. F. Barry.
Kingston	Roane	Sept. 30-Oct. 3 ..	S. R. Sparks.
Lewisburg	Marshall		C. C. Wallace.
Memphis	Shelby	Sept. 22-27	F. D. Fuller.
Morristown	Hamblen	Sept. 3-5	C. B. Weesner.
Murfreesboro	Rutherford		B. B. Kerr.
NASHVILLE			
(State)	Davidson	Sept. 29-Oct. 4 ..	J. W. Russwurm.
Newport	Cocke	Aug. 26-28	Jno. M. Jones.
Paris	Henry	Oct. 8-11	R. H. Hudson.
Rhea Springs	Rhea	Oct. 6-11	H. B. Payne.
Rome	Smith	Aug. 14-16	A. T. Williams.
Selmer	McNairy	Oct. 14-17	W. K. Abernathy.
So. Pittsburg	Marion	Oct. 14-17	W. H. Wilson.
Spring City	Rhea	Oct. 7-11	J. W. Fischesser.
Sweetwater	Monroe	Sept. 16-19	Jas. R. Love.
Tullahoma	Coffee		John W. Harton.
Union City	Obion	Sept. 10-14	J. W. Woosley.
Winchester	Franklin	Sept. 2-5	T. B. Anderton.

GOOD ROADS.

In the past three years it is roughly estimated that the percentage of improved roads in the United States had gone well beyond 9 per cent and possibly close to 10 per cent. It is estimated that if 20 per cent of the public highways were improved—each highway being selected and improved with a view to the proportionate traffic upon it—a high degree of efficiency in highway transportation would be reached. It is figured that millions of dollars would be saved annually in the transportation of crops, the wear and tear on horses and vehicles, and in the minimizing of the waste in truck farming. Where roads are bad the farmers frequently find it impossible to get their products to the shipping points and thus perishable products are wasted, perceptibly increasing the cost of living.

The most desirable communities in which to live are the communities in which people work nicely together and cooperate in the various enterprises common to the community.

BETTER PRICES FOR FARM LABOR.

Reports received from correspondents of the Bureau of Statistics of the Department of Agriculture indicate that the money wages of farm labor of the United States increased about 3.2 per cent during the past year, and 7 per cent during the past two years. Since 1902 the increase has been about 34 per cent.

The wages of farm labor had an upward tendency during the decade of the seventies (considered on gold basis), they were almost stationary during the eighties, and declined from 1892 to 1894, since which year they have been steadily tending upward. Wages now, compared with the average of wages during the eighties, are about 53 per cent higher; compared with the low year of 1894 wages are now about 65 per cent higher.

The current average rate of farm wages in the United States, when board is included, is, by the month, \$20.81; by the day, other than harvest, \$1.14; at harvest, \$1.54. When board is not included the rate is, by the month, \$29.58; by the day, other than harvest, \$1.47; by the day, at harvest, \$1.87.

Wages vary widely in different sections of the United States; for instance, the monthly rate without board is \$56.50 in Nevada, \$53.80 in Montana, and \$51.60 in Idaho; \$17.10 in South Carolina, \$19 in Mississippi, and \$19.50 in Alabama.

Following are the averages for the United States for the past year, with comparisons:

By the month—With board, 1912-13, \$20.81; 1911-12, \$20.18; 1902, \$15.51; 1894, \$12.70. Without board, 1912-13, \$29.58; 1911-12, \$28.77; 1902, \$22.12; 1894, \$18.57.

By the day (not at harvest)—With board, 1912-13, \$1.14; 1911-12, \$1.09; 1902, 83c; 1894, 65c. Without board, 1912-13, \$1.47; 1911-12, \$1.42; 1902, \$1.09; 1894, 84c.

By the day at harvest—With board, 1912-13, \$1.54; 1911-12, \$1.49; 1902, \$1.25; 1894, 97c. Without board, 1912-13, \$1.87; 1911-12, \$1.89; 1902, \$1.51; 1894, \$1.18.

APRIL CROP REPORT.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., May 1, 1913.**

Correspondents in eighty-eight of the ninety-six counties of the State reported on crop conditions and prospects for the month of April.

Moderate temperature and dry weather marked the greater part of the month, and rain was needed toward the last of April. High water in the early part of the month delayed farming operations in the river sections; however, much work was done during the month in putting in corn and cotton.

Gardens are reported in good condition, and in the trucking sections of the State prospects are good for a fine season, especially in strawberries.

Alfalfa is reported in excellent condition where stands have been obtained. Young clover and meadow grasses are also reported doing well.

Some damage was done by frosts to the peach prospects, but the damage was not so bad as first reported. Indications are for a half crop or better. Apples were not damaged as much as peaches.

With the exception of hogs, live stock in the State is reported in excellent condition. Hog cholera has done great damage in the State and is still prevalent.

No report was issued for April, 1912, and no comparison is offered. Taking 100 as a normal crop, the following figures are compiled from the reports:

Cotton, acreage	95
Wheat, condition	87
Garden, condition	84
Oats, acreage	85
Oats, condition	87
Young clover, acreage	87
Young clover, condition	83
Meadow grasses, condition	89
Corn, acreage	91
Corn, condition	82
Tobacco, acreage	86
Apples, condition	77
Peaches, condition	63
Grapes, condition	83
Irish potatoes, acreage	89
Tomatoes, condition	86
Peanuts, acreage	89
Live stock, condition	89
Alfalfa, acreage	84
Alfalfa, condition	86

MAY CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY	Cotton—acreage	Wheat—condition	Garden—condition	Oats—acreage	Oats—condition	Young Clover— acreage	Young Clover— condition	Meadow Grasses— condition	Corn—acreage	Corn—condition	Tobacco—acreage	Apples—condition	Peaches—condition	Grapes—condition	Irish Potatoes— acreage	Tomatoes—acreage	Tomatoes—condition	Peanuts—acreage	Live Stock—con- dition	Alfalfa—acreage	Alfalfa—condition
A Alluvial Plain of the Mississippi River and Plateau Slope of West Tennessee.	Lake	50	...	60	75	90	...	80	80	30	...	...	80	60	60	...	...	...	...	75	20	80
	Obion	100	80	100	95	90	85	75	100	90	75	100	60	70	90	...	...	...	75	95	80	80
	Dyer	90	85	90	100	90	90	85	100	100	100	...	75	50	50	100	100	75	100	90	100	80
	Lauderdale	100	80	80	100	90	95	95	100	100	85	...	95	90	...	95	95	75	...	100	...	95
	Tipton	95	90	95	90	90	90	95	95	100	85	...	95	95	100	100	100	...	...	95	...	...
B Brown Loam Table- lands, Middle Counties of West Tennessee.	Shelby	100	90	90	85	90	85	90	95	95	80	...	60	80	95	85	80	90	...	85	...	...
	Weakley	100	80	70	90	75	90	80	80	95	85	90	85	80	90	90	90	80	...	85	...	...
	Gibson	100	85	95	100	95	100	95	100	90	...	95	80	90	90	75	90	90	...	...	100	100
	Crockett	100	80	75	60	90	100	80	90	90	90	...	100	75	...	100	...	90	...	90	100	90
	Madison	90	95	100	100	100	100	100	100	100	95	...	...	...	...	...	...	...	...	95	100	100
C Summit Region of Watershed, West Ten- nessee.	Haywood	...	...	...	30	60	...	90	...	50	...	...	...	50	...	...	...	...	...	...	...	...
	Hardman	...	...	25	25	...	...	...	...	...	75	...	...	...	...	85	...	...	...	...	...	...
	Fayette	95	65	70	85	95	...	...	90	95	...	...	75	80	90	85	70	60	...	80	...	...
	Henry	...	80	85	100	80	100	80	80	...	...	...	80	65	75	100	100	100	100	90	...	...
	Carroll	95	50	100	100	85	90	80	85	100	...	100	75	85	...	...	...	...	...	100	...	...
D Valley of Tennessee River, West and Mid- dle Tennessee.	Henderson	85	...	80	95	80	75	75	75	100	85	...	90	85	...	...	...	...	...	80	...	...
	Chester	100	80	...	100	90	85	80	...	100	...	...	80	45	85	100	75	95	...	85	...	...
	McNairy	100	...	90	85	90	100	100	90	100	90	...	...	...	...	...	...	...	...	95	100	100
	Stewart	...	80	60	90	95	90	95	70	100	60	...	95	70	75	100	...	...	...	95	...	...
	Benton	95	75	85	85	80	85	85	95	100	...	...	95	75	100	95	100	...	...	90	95	...
	Houston	...	90	90	85	80	100	90	90	100	...	95	100	75	100	100	100	80	90	100	80	90
	Humphreys	...	75	80	85	95	90	70	75	90	50	...	75	75	65	90	...	...	...	85	...	...
	Decatur	100	...	80	90	95	90	85	90	95	40	...	80	75	75	90	50	70	80	80	60	70
	Perry	100	90	70	100	100	100	100	100	100	70	...	...	30	...	...	...	...	...	100	...	...
	Hardin	90	100	80	80	100	75	80	60	90	...	...	90	25	...	...	...	...	...	80	100	...

MAY CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY	CUMBERLAND TABLE- LAND AND VALLEY OF EAST TENNESSEE.																					
		Cotton—acreage	Wheat—condition	Garden—condition	Oats—acreage	Oats—condition	Young Clover— acreage	Young Clover— condition	Meadow Grasses— condition	Corn—acreage	Corn—condition	Tobacco—acreage	Apples—condition	Peaches—condition	Grapes—condition	Irish Potatoes— acreage	Tomatoes—acreage	Tomatoes—condition	Peanuts—acreage	Live Stock—con- dition	Alfalfa—acreage	Alfalfa—condition	
J Cumberland Table- land and Valley of East Tennessee.	Claborn	80	60	65	70	85	95	60	65	25	...	80	75	75	...	100	90	...	...	100	...	...
	Campbell	...	90	100	100	100	100	100	100	...	...	...	85	90	...	100	100	...	...	100	...	...
	Anderson	...	95	85	85	90	50	80	85	100	80	85	80	90	...	100	100	...	90	90	...	...
	Rhea	...	90	80	80	70	60	80	80	90	100	...	...	...	...	75	80	...	...	80	...	...
	Bledsoe	...	90	90	70	90	90	90	100	100	90	80	90	...	70	100	80	90	...	100	60	90	
	Sequatchie	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Marion	...	90	75	75	75	90	60	75	90	60	...	25	10	...	70	...	...	...	...	...	...
	Hamilton	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Sullivan	...	85	...	100	90	100	85	...	100	...	...	...	...	...	90	...	...	...	85	...	...
	Hawkins	...	85	75	90	90	40	75	90	75	...	...	100	60	...	90	40	...	...	90	...	...
K East Tennessee Val- ley.	Hancock	...	90	80	100	100	80	90	90	90	100	100	100	80	100	100	100	100	...	80	100	...	
	Washington	...	100	100	80	100	100	100	100	95	100	100	80	70	80	100	100	100	...	80	100	...	
	Hamblen	...	95	100	50	80	85	90	95	95	75	100	40	50	75	90	90	100	...	100	100	95	
	Gainger	...	90	...	...	...	85	...	...	100	...	...	75	40	75	70	50	...	...	100	40	30
	Union	...	80	75	95	85	60	50	75	80	75	...	90	85	100	70	100	...	...	100	80	80
	Jefferson	...	90	...	...	50	100	90	100	100	90	100	75	80	...	90	85	...	...	85	90	85
	Knox	...	70	80	35	70	60	90	85	100	85	...	75	90	85	90	85	...	...	100	85	85
	Roane	...	85	85	70	80	75	85	95	95	85	...	90	85	...	75	50	60	...	100	100	100	
	Loudon	...	60	75	50	50	50	100	...	...	...	...	50	75	...	100	75	...	...	30	100	100
	McMinn	...	100	95	100	95	100	95	95	100	85	...	85	80	90	80	80	75	...	90	85	85	
L Valley of East Ten- nessee and Unaka Re- gion.	Meigs	...	90	85	100	90	100	90	90	90	90	90	95	70	80	80	80	...	...	70	85	85
	Bradley	...	100	80	85	60	65	75	75	80	90	90	50	70	100	50	...	...	...	95	85	...
	James	...	100	80	85	75	85	80	95	80	...	...	50	50	...	...	...	...	...	...	...	...
	Johnson	...	100	100	100	90	100	100	100	100	...	...	80	75	...	100	100	...	...	100	100	95
Valley of East Ten- nessee and Unaka Re- gion.	Carter	...	95	80	100	95	100	90	95	100	90	...	...	...	...	100	100	...	...	90	100	95
	Unicoi	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Greene	...	90	85	95	90	100	85	100	...	...	100	95	70	90	90	90	...	...	95	...	...
	Cocke	...	75	80	75	85	85	75	90	95	85	100	65	75	90	90	90	...	...	90	85	...
	Sevier	...	95	90	95	90	90	90	90	95	...	...	65	80	85	85	85	...	...	95	85	90
	Blount	...	90	85	95	90	75	90	85	85	50	...	85	40	75	...	...	...	...	85	100	100
	Monroe	...	100	95	100	100	95	95	100	100	90	...	...	80	100	85	...	...	...	95	100	100
Polk	90	85	95	95	100	50	25	...	60	100		
	Gen. average	95	87	84	85	87	87	83	89	91	82	86	77	63	83	89	86	85	89	89	84	86	

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IN THIS ISSUE:

East Tennessee Farmers' Institute.

Conservation of Agricultural Resources.

Sorghum Poison in Cattle.

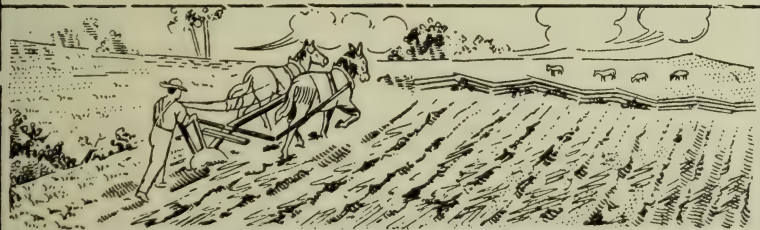
Destructive Melon, Cucumber and Cantaloupe Insects
in Tennessee.

Reasons Why Failures Occur in Bee-Keeping.

Protect the Birds.

Use of Commercial Fertilizers. Hints to Poultry Raisers.

May Crop Report.



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JUNE 1, 1913.

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EAST TENNESSEE FARMERS' CONVENTION AND INSTITUTE.

The fortieth annual meeting of the East Tennessee Farmers' Institute and Convention at Knoxville, May 20, 21 and 22, was the largest in its history from point of attendance, over three thousand farmers taking part in the proceedings. On Tuesday, May 20, morning, afternoon and evening sessions were held. Excellent addresses were delivered, as follows: President's address, W. B. Stokely, of Dandridge, followed by Hon. T. F. Peck, Commissioner of Agriculture for the State of Tennessee. Prof. C. A. Mooers, of the Tennessee Experiment Station, discussed methods for getting and maintaining stands of clover and grasses. Addresses pertaining to rural education and rural problems were delivered by Prof. J. W. Brister, State Superintendent of Schools; Prof. E. S. Richardson, College of Agriculture, Louisiana State University; T. J. Coates, Rural School Inspector of Kentucky, and Mrs. J. A. Reagan, of Sweetwater, Tenn.

SECTIONAL MEETINGS.

The morning of the second day was devoted to sectional meetings, viz.: Horticulture, dairy, general farm and live stock, Boys' Corn Club, and home-makers' sections. Truck farming in all its phases was discussed at length in the horticulture section. The opening discussion was led by C. B. Flannery, of Knoxville, on general truck problems. The delegates participated in it. W. R. Hawk, of Jackson, Tenn., discussed sweet potato growing; W. T. Moore, of Cleveland, discussed the tomato as a money crop and its possibilities in the canning industry; Frank Jarnagin, of Jefferson City, discussed onions; S. R. Ogden, of Concord, discussing "Trucking as a Side Line," dealt with the general subject in a broad manner and from a practical standpoint.

At the dairy section Dr. C. M. Morgan, dairy agent for the Southern Railway, spoke on dairy management, or, as he said in taking up his subject, "Lack of Dairy Management." Helmer Rabild, of the United States Department of Agriculture, dairy division, spoke on "Cow-Testing Associations," and gave some statistics of the dairy industry in the South. Mr. Shuffort, of Hickory, N. C., spoke at length on "Cooperation of Dairyemen in the Disposal of Their Output," urging closer business relations one with the other. Prof. C. A. Willson, of the University of Tennessee, spoke on "Relation of Feed to Production of Dairy Cows."

More than one hundred boys of East Tennessee, members of Boys' Corn Clubs, heard Capt. T. F. Peck, State Commissioner of

Agriculture, talk on the importance of the corn club. Following this the boys elected Clyde Dinwiddie, of Jefferson County, as President of their organization. Prof. Clarendon Davis, of Huntsville, Ala., spoke on "Why the Corn Club Boy Should Be a Land Builder"; Prof. Henry Clark, of the University of Tennessee, told "How a Corn Club Boy Went to College"; J. A. Dinwiddie, of Newmarket, Assistant State Agent for East Tennessee, told the boys how to increase their yields of corn and gave the specific things in corn raising that the boys wished to hear. Prof. J. C. Pridmore, of the University of Tennessee, talked to the boys on "How to Select Ten Ears of Corn That Would Win a Prize."

The home-making section was conducted at the domestic science department of the University of Tennessee. Miss Maria Willoughby,



Machinery Exhibit at East Tennessee Farmers' Institute.

of Washington, D. C., talked on "Country Club Work," and Dr. Olin West, Secretary of the State Board of Health, gave a general talk on health conditions in public schools. Miss Stone read an excellent paper on child welfare.

The sectional meeting of the general live stock and farm department was held in Temple Hall, President W. B. Stokely presiding. This was one of the best meetings, both from point of attendance and interest aroused. Three papers were offered. Dr. George R. White, State Veterinarian, Department of Agriculture, at Nashville, spoke on "Common Diseases of Sheep and Cattle and How to Control Them." He estimated that the loss to the State per year in all classes of diseases

is \$8,000,000. He also stressed hog cholera in the course of his remarks. Mr. Archibald Smith, of the Agricultural College of Mississippi, spoke on the results of recent experiments in the stall and pasture feeding of beef cattle.

State Feed and Seed Inspector A. L. Garrison, of Nashville, spoke on Tennessee's feed and seed laws, and dealt particularly with the reform of the conditions. He said that in the years of 1911 and 1912 the State had been 75 per cent better than ever before.

AFTERNOON SESSION, MAY 21.

The principal events of the day were the speeches delivered at the afternoon session by President W. W. Finley, of the Southern Railway Company, and Joe E. Wing, of Mechanicsburg, Ohio, the "Alfalfa King of the East." The address of President Finley was on "Progressive Agriculture," and referred especially to the South. He dealt with the waste places in Southern agriculture and bade the farmers repair them. Joe E. Wing, who is one of the best agricultural speakers and writers in the country, was the leader of the alfalfa symposium, and was warmly cheered as he appeared on the platform. His address was the simple narrative of how he has converted the 160-acre farm left him by his parents in Ohio from a weak, worn-out farm to a great money-making machine, and one of the best known farms in America. He told how he learned to love alfalfa when he was a cowboy in the West, and the success he has made of it in the East. Following Mr. Wing's address, a general discussion on alfalfa took place. Among the speakers were P. G. Holden, Chicago, Ill.; O. P. R. Fox, Hamblen County; George H. Pepper, Johnson City, and J. W. Fisher, Newport. Clarendon Davis, Huntsville, Ala., was the concluding speaker of the afternoon, he speaking on "The Business of the Farmer," in which he urged a more systematic manner of conducting farms.

The evening session was devoted to a conference on rural life, at which Prof. E. S. Richardson, of Baton Rouge, La.; T. J. Cootes, of Frankfort, Ky.; Miss Virginia P. Moore, State Organizer of Girls' Tomato Clubs, and Prof. Harry Clark, of the State University, were the speakers.

THURSDAY, MAY 22.

The morning sessions were devoted to sectional meetings, viz.: Dairy, horticultural, general farm and live stock sections.

At the dairy section, Mr. C. A. Hutton, of Friendsville, discussed "Milk Production Per Acre." He was followed by H. N. Camp, Jr.,

of Knoxville, on "How to Make a Cheap, Desirable Silo." The question of "Calves and Hogs as Dairy By-Products" was discussed by Charles J. Beal, Rogersville, and S. O. Montgomery, Greenback.

The horticultural section was held out at the university fruit farm, at which time Prof. C. A. Keffer, of the University of Tennessee, showed by actual demonstration how to summer-prune the peach, and Prof. G. M. Bentley, State Entomologist, demonstrated orchard spraying with power and hand machines.

At the general farm and live stock section, Wayne Dinsmore, of Chicago, Ill., Secretary of the Percheron Society of America, gave an excellent address on horses and mules. He emphasized the importance of having big mares, draft mares, to get big mules. He had four big gray Percheron mares brought before the audience and pointed out their good qualities, giving some valuable information on the subject of draft horses.

Another important thing was the formation of the East Tennessee Cooperative Breeders' Association at a meeting of the stock breeders attending the farmers' convention. This is expected to mark a milestone in the history of animal husbandry in East Tennessee. This is to be an active cooperative body, serving the breeder directly in finding and opening new and better markets, and promoting all things pertaining to this industry.

W. B. Stokely, President, and F. H. Broome, Secretary, were re-elected for the ensuing year.

The next issue of Tennessee Agriculture will be devoted to the publication of addresses and papers given before the members of the institute.

SPECIAL EDITION OF EAST TENNESSEE FARMER.

The special edition of Knoxville's good farm paper, the East Tennessee Farmer, issued on May 20, and distributed among the delegates to the East Tennessee Farmers' Convention and Institute, was a credit to its publisher, Mr. W. D. Williams, and was highly complimented by the farmers in attendance on the convention.

The number was splendidly illustrated, and full of good reading matter for the farmer and his family. While only a little more than half a year old, The East Tennessee Farmer has already attained a wide circulation among the farmers of Tennessee and adjoining states.

The East Tennessee Farmer devotes the greater part of its space to conditions local to East Tennessee, and for that reason is of very great value to the farmers of that section.

CONSERVATION OF OUR AGRICULTURAL RESOURCES.

The following address was delivered by Capt. T. F. Peck, Commissioner of Agriculture, at a banquet tendered the press of the United States by the National Conservation Exposition:



MR. TOASTMASTER:

I am more than pleased that our people of the South are waking up to the importance of the conservation of our resources of every character. I am gratified to know that this great conservation exposition is to be located in Tennessee—in East Tennessee—in Knoxville—right in the heart of a section that cannot be surpassed for the richness or great variety of its resources.

Our resources have been so abundant and so varied in character that we have been lavish in their use and it is fortunate that we are to have this great exposition here to emphasize the importance of conserving and intelligently using them.

I want, especially, to emphasize the importance of conserving our agricultural resources, most important of which is our soils. The soil is the farmer's capital and should be conserved.

Every one will admit that on the prosperity and productive capacity of our agricultural classes depends the prosperity of all engaged in other professions and vocations.

Our farmers must be made to realize the importance of maintaining the fertility of their soils and must be shown how they can do so and at the same time provide for their families. They must be convinced that the South is the rightful home of the live stock industry, that we can grow crops to feed animals, to feed the soil, thus completing the agricultural cycle, a law of nature that cannot be violated without paying the penalty of decreased crop production. Our people here in the South have been violating this law of nature with the result that not only are our farmers feeling the effects, but all who buy farm products, because of decreased production with resultant high prices.

Most of the cottonseed meal produced in our cotton-growing States is exported to other countries. This cottonseed meal, if fed to animals, will produce manure worth 80 per cent of the cost of each ton. Can we afford to export cottonseed meal for which the buyer can afford to pay the prevailing prices for feeding purposes when it has the same feeding value to our farmers with the 80 per cent additional value in maintaining the fertility of our farms?

We are importing into our territory thousands of tons of timothy and other grass hay of low nutritive value, feeding to our animals, the resulting manure of little value for plant, when we can grow soy bean hay, pea hay or clover hay, all nitrogenous plants for producing a hay nutritious for our live stock and the resulting manure rich in plant food for our soils.

Our annual average rainfall of more than 50 inches, if properly conserved, would be one of our greatest resources. If utilized as it could and should be, it would give us an advantage over the farmers in the best of irrigated sections of the Western States.

What have we been doing? Breaking our land from two to four inches deep, forming under the soil a hard-pan that is impervious to water, giving us practically no reservoir to store up moisture to grow crops. When the rain falls it not only runs off, washes our land and carries with it the available plant food and vegetable matter that is needed for plant growth and to keep the soil in proper mechanical condition, open and porous so that the water, the air and frost can penetrate it. Our farmers can correct this abuse and prevent the waste by deep plowing, turning under vegetable matter, keeping a cover crop on their land in winter, thoroughly pulverizing the soil for a seed bed and doing thorough shallow cultivation at frequent intervals during the growing season.

I could continue at some length to enumerate the things we are doing to deplete our soils and then show how we can improve them. The solution of the problem of soil reclamation, with increased crop production, has been very satisfactorily worked out and repeatedly proven, and is being successfully practiced by a small percentage of our farmers. Interest in better farming methods has been aroused with practically all of our farmers in Tennessee. They are in a receptive mood, eager for information. Our duty and our opportunity are now confronting us. We should conduct a campaign of education with the backward farmer. We must conduct that campaign on practical lines within reach of the farmer who needs it most. We must offer the farmer something that will blend in with his life work.

This conservation exposition offers an opportunity to do much to stimulate the farmer to take better care of his soil, his live stock and to increase the productive capacity of his farm and to eliminate the leaks and waste that have been disastrous to so many farmers.

I want to assure you gentlemen in charge of this conservation exposition that the Tennessee Department of Agriculture will render you every assistance in its power. We know you will succeed. The personnel of the management guarantees that fact, to say nothing of the powerful influence of the various interests that are so vitally interested in the conservation of our varied resources that will, if for no other than selfish reasons, render you assistance and cooperation.

You will have the cooperation of the press, the most powerful influence in our country today. I say you will have their cooperation because I have always found the press ready to take the initiative in any movement for progress or development. I can say for the press of Tennessee that their splendid cooperation with the Department of Agriculture has doubled the efficiency of the work of our Department.

The press of the State is largely responsible for the splendid progress being made by the farmers of the State. Knowing the progressive policy of the press, and knowing the importance and value of the work you contemplate, I am sure you will have their splendid cooperation. We will have a great exposition. Our people will be made to appreciate the importance of conserving the splendid resources of our country so that not only the people of today but coming generations may enjoy the generous provisions of an All-Wise Providence.

DO NOT FEED MOLDY CORN.

Moldy corn will produce blind staggers in horses, and it should never be fed to them. Every year there is considerable trouble with this disease in the West, and in almost every case the cause is moldy corn. If this corn does not produce blind staggers, it will tend to injure the physical condition of the animal. So don't feed it, and be careful about pasturing the horses in stalk fields where there is moldy corn.

While pork can sometimes be made at a profit when corn is supplemented with nothing but a concentrated feed, still it is not wise to use concentrated supplements alone.

SORGHUM POISON IN CATTLE.

BY G. R. WHITE, STATE VETERINARIAN.



The plant botanically known as *Sorghum Vulgare*—or, as referred to throughout this section of the country as “sorghum”—when eaten by cattle during certain stages of its development is a deadly poison on account of the prussic acid which it contains. Prussic acid is recognized the world over as one of the most dangerous and deadly poisons.

Sorghum retarded or stunted in growth contains a larger per cent of prussic acid than does that which grows rapidly and develops into a healthy, vigorous plant. The leaves are more heavily loaded with prussic acid than the stalk. As much as 1 per cent prussic acid has been extracted from sorghum leaves. This would mean that one pound of these green leaves would contain a fatal dose for an ordinary cow or steer. In mature sorghum the stalks and seeds do not contain prussic acid.

There is an erroneous impression abroad to the effect that it is only the second crop of sorghum which is poisonous to cattle. This is incorrect, as the first crop contains as large per cent of the poison as does the second crop. However, this erroneous idea arises from the fact that the first crop is rarely ever pastured, whereas it is not at all unusual, especially in the early fall, for cattle to be turned into fields where the shoots and the young plant of second growth, or crop, are developing. It is under these conditions that the cattle owner should fear death from sorghum poison. Every year in Tennessee during the late summer and early fall hundreds of cattle are lost from poison of this character.

Experiments to date demonstrate that dry, clear weather, by arresting the normal development of the plant, is the chief cause of the formation of abnormal quantities of poison.

Symptoms.—The usual symptoms presented may be summarized about as follows. However, it should be borne in mind that these symptoms may vary, depending upon the amount of sorghum con-

sumed and the per cent of prussic acid which it contains, the susceptibility and size of the individual animal, etc.:

Drowsiness, fluid discharge from eyes, involuntary twitching of the muscles, numbness of limbs, incoordination of movement, staggering gait, inability to stand, dizziness, involuntary passing of urine and faeces, stopped rumination, dull expression from eyes, free flow of saliva from mouth, partial or complete paralysis of tongue and throat, limbs and ears cold, weak heart action, pupils dilated. All the symptoms increase in intensity until there is complete coma, after which death quickly ensues.

Antidotes.—Corn syrup in 1 pint doses every thirty minutes. Fresh air and milk.

TENNESSEE STATE FAIR.

The Tennessee State Fair, which will be held this year during the week of September 29-October 4, promises to be the most successful in the history of this institution. The recent session of the General Assembly appropriated \$40,000 for the use of the Fair. Part of this amount has been used to pay off outstanding indebtedness.

The Board of Trustees of the State Fair, of which Commissioner of Agriculture T. F. Peck is Chairman, and J. W. Russwurm is Secretary, is making extensive preparations for the coming Fair. The grounds will be put in first-class condition, and the premiums offered are such as to attract the best exhibitors in all classes.

The Woman's Board of the State has selected Mrs. T. G. Settle as Chairman of that department, and has named Mrs. Charles W. Baker as Secretary. Miss Gertrude Hill is Director of the Children's Department and the Department of Education.

The Nashville Railway & Light Company is preparing to make extensions and improvements on its lines at the grounds to enable it to more expeditiously handle the large crowds expected.

The amusement features at the coming Fair will be better than ever before, and many new features will be included.

In buying feed remember that white middlings is better than the brown, that white oats is to be preferred to the black, that coarse bran is better than fine, that hulled oats is better than oats with the hulls on, that white corn is not so fattening as the yellow variety, and that Kaffir corn is an excellent grain, and should be more extensively fed.

DESTRUCTIVE MELON, CUCUMBER AND CANTALOUPE INSECTS IN TENNESSEE.

BY G. M. BENTLEY, STATE ENTOMOLOGIST AND PLANT PATHOLOGIST.



Melons are attacked by a large number of different insects; those having biting mouth parts and those having piercing mouth parts, hence it is a problem to treat melon insects successfully with one treatment. However, the most destructive insects attacking melons, cantaloupes and cucumbers are the striped cucumber beetle (corn root worm), the pickle or cantaloupe worm, the squash vine borer, the melon aphid and the squash bug. The first five members of this

group are chewing insects and the last two are piercing insects. One might conclude that a poison spray like Paris green or lead arsenate might serve the purpose of controlling the first group, while an oil emulsion or some contact spray might reach the latter. Due to the habits of the melon insects, this method of treatment cannot be followed with results, both on account of the feeding habits of the young and the migratory habits of the adults.

THE STRIPED AND SPOTTED CUCUMBER BEETLES.

The striped and spotted cucumber beetles can best be controlled by protecting the plants from them by simple and inexpensive covering of light material, such as cheesecloth. It is only for a short time that melons of the cucurbitid group are attacked by these insects, hence it is in order to do everything to encourage the rapid growth of the plants by the use of quickly available fertilizers. The writer has found that as a secondary remedy very fine road dust, in which a few drops of turpentine has been added, frequently dusted over the melon vines acts effectively in keeping down these beetles as well as other melon insects.

THE PICKLE WORM.

The cantaloupe growers of this state suffer more loss from the pickle worm (*Margaronia Nitidalis* Cram) than from any other insect. Its appearance in great numbers some years, followed by a season or two in which it will hardly be found, has caused many questions to

be asked regarding its life history. The eggs are laid by a moth about three-fourths of an inch in length. They are usually placed upon the flowers, buds or tender portions of the vines of cucumbers and cantaloupes. The eggs hatch in from four to six days. The newly hatched forms feed upon the leaves and stems. They begin eating the melons after the first moult and continue until they pupate. A round hole is eaten in the center of the cantaloupe; some of the center is also eaten, and the whole melon is ruined for market. In a year in which these insects are plentiful they mean fully 75 per cent loss. The pupa is formed in debris or in a folded leaf and from this the mature moth emerges. There are at least four broods of this insect in this state. They pass the winter in the pupa stage above the ground, and emerge very late in the spring into a yellowish-brown night-flying moth.

Remedies.—Since the pupa passes the winter above ground, it follows that the destruction of all the vines as soon as the crop is off will prevent many moths from emerging. Deep plowing will also destroy many of the wintering forms. It is also advantageous to plant the cantaloupes early. Experiments by Quaintance and others prove that the squash planted as a catch crop works successfully. The squash is planted so the eggs of the pickle moth can be deposited in its bloom and vines. Before the young become grown all the squash vines are destroyed.

THE SQUASH VINE BORER.

The adult of this insect is one of the clear-winged moths which measure about one and one-fourth inches across the wing. The eggs of this moth are laid upon all parts of plants, but most especially upon the stems near the base. In from ten to fourteen days the eggs hatch and the young immediately enter the main stem of the melon and eats its way through the stem, causing the wilting and dying of the vine. It is plain to see that no poison could be used in controlling the insect, feeding as it does on the inside of the vine. About the only effective methods of control are cultural. The vines should be raked up and destroyed after the crop is gathered. In that this insect passes the winter in the soil near the vine, deep fall and early spring plowing would destroy large numbers. Rotation is also an effective means. This insect attacks squash more than any other cucurbits and is especially fond of summer squash, and this is frequently used as a catch crop with later varieties. When the early squash is highly infested the vines should be destroyed, thus killing many of the developing borers.

THE MELON LOUSE.

The melon louse, a small piercing insect, is especially bad in seasons like the present. A mild winter, followed by a cool, damp spring, greatly increases their development and it is likely that this pest will rank among the chief ones affecting the melons this year. A similar insect on grain, known as the "Green bug," has been exceptionally bad throughout the south this season. When weather conditions are dry and there is plenty of sunshine, a small bee as a parasite on these forms is an effective agent in keeping them in control. As a treatment for controlling this louse, a strong liquid of tobacco and soap solution will, if applied early, work admirably in controlling the insect. There is a tobacco product in use today known as "Black Leaf 40." Three pints of this solution mixed with three pounds of soap and diluted with 100 gallons of water and applied to the vines will control the louse. The road dust with a few drops of turpentine, frequently dusted over the vines, will also help in controlling this insect.

THE SQUASH BUG.

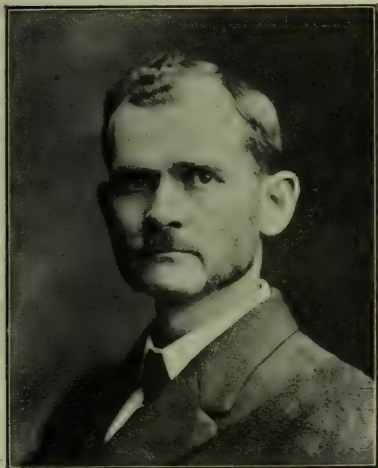
The squash bug, another piercing insect, is so familiar to every one that description is unnecessary. This insect may be controlled by spraying with the tobacco and soap solution mentioned above. Squash planted among the cucumbers and melons will act as a bait for the squash bug and may be thus used as a catch crop.



Pure-Bred Berkshire Sow and Pigs on Farm of A. C. Phillips,
Watertown, Tenn.

REASONS WHY FAILURES OCCUR IN BEE-KEEPING.

BY J. S. WARD, STATE INSPECTOR OF APIARIES.



1. Lack of Knowledge. In these days of progress the man who does not "know how" is outstripped in the race and soon drops out of count. In no occupation is education more essential to success than in beekeeping, and the broader the education the better able is the apiarist to solve the problems and plan for the best returns. This education should be not alone in the experience of the beeyard, but in the writings of the most practical beekeepers. In other words, two or

three good text-books should be purchased and not simply read, but studied as one would study history and grammar. Learn the anatomy and physiology as well as the habits of the bee. Become acquainted with all modern, approved appliances so that an intelligent selection may be made for each location and the purposes of the individual beekeeper. Subscribe for one or more of the bee journals and attend the meetings of bee associations.

2. Using Antiquated Appliances. Discard all the old home-made boxes and the old "gums" that were cut from the hollow logs in the forest. Transfer from these unsightly, unprofitable hives to the modern hive with its movable frames and convenient appurtenances. Purchase a good smoker, a veil, use full sheets of comb foundations, get a honey extractor and wax press and success will be the result instead of failure.

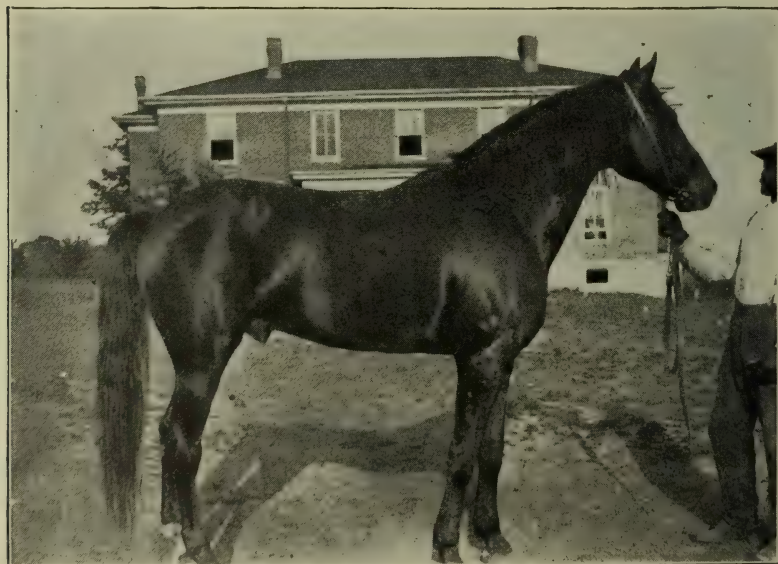
3. Starting With Too Many Colonies. In no occupation is it more important to start on a small scale than in beekeeping. One can easily overstock himself in the beginning and become discouraged over not being able to master accumulated details. Failure results. Start with only four or five swarms. Master them, and then the next year fifteen or twenty can be cared for and later 75 or 100 in each yard. The mastery of out yards belongs to advanced beekeeping.

4. Carelessness. Successful beekeeping is an intensive occupation. It is exacting in its details. It brooks no delay. Tomorrow will never do when today demands attention. The busy bee awaits not upon the

sllothfulness of the sluggard or the delays of the time-killers. The successful apiarist keeps his work all ready for the demands of the swarming season. All supplies should be purchased in the winter time. Hives should be nailed together and painted. Frames should be wired, filled with comb foundations ready for the swarms. Supers should be prepared and stacked up in a honey house, convenient to the apiary, ready for the honey flow. Neglecting these things until the demands come means failure in a honey crop.

Carelessness brings starvation, will start robbing, will encourage the bee moth, and later on the colonies succumb to the ravages of one of the foul brood diseases. Finally, the beekeeper becomes discouraged and persuades himself that he hasn't the time anyway to "fool" with bees and failure is the culmination of what might have been the most profitable specialty about his farm.

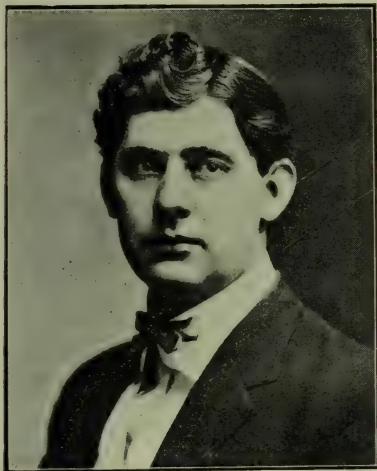
Charcoal is a pressing essential for poultry, especially at this season. Instead of buying it, rake up some old chunks of wood, cobs and other refuse about the place, setting fire to them. When the heap turns to a mass of hot coals, smother it down with a little water or dirt, and when it cools, you will have a handy supply of charcoal and be rid of the rubbish.



The Abbe 2:04-2:10½. Great Double Record Stallion. Under Management of John W. Alexander, Lynnville, Tenn.

PROTECT THE BIRDS.

BY A. L. GARRISON, CHIEF FEED AND SEED INSPECTOR, DEPARTMENT OF
AGRICULTURE.



I am influenced by neither sentiment nor patriotism in writing this article, but I write it on a condition of existing facts which would be folly for anyone to undertake to deny or dispute. My information on the subject is limited to my own personal observation and may not therefore be presented in as logical and as forceful manner as the subject deserves.

I wish I were able and had an opportunity to speak my feelings, and be understood, to every man, woman and child in Tennessee. In a state and country where we are capable of doing and where we actually do great things, we are prone to forget and neglect some things that are apparently small but which are in reality great.

The protection of non-game birds means millions of dollars to the farmers of this country in insect destruction and weed eradication. I may be somewhat cranky and overzealous when I state that it is the height of ingratitude to watch a catbird satisfy her appetite by eating a handful of caterpillars from a choice apple tree, then to take the taste out of her mouth flit away for a ripe cherry or berry of some kind and in doing so get shot—ingratitude exemplified by a real tragedy—a benefactor and a friend slaughtered by him to whom it was sent by a wise Creator to benefit economically, and to cheer with its message of love given forth from vocal chords never to be equalled or approached by the most accomplished prima donna.

The people are aware as never before of the cruelty as well as the economic loss involved in the unchecked slaughter of birds. One of the minor features of the Underwood Tariff Bill is to this end: "The importation of the feathers, quills, heads, wings, skins or parts of skins of wild birds, either raw or manufactured, and not for scientific or educational purposes, is hereby prohibited." The prohibition is the favorable response to the humane sentiment of the country

and is aimed to stop traffic in the trophies of as wanton a slaughter as was ever perpetrated to cater to the vanity of human kind.

If the farmers, the school teachers, the newspapers and other like agencies would exert their powerful influence for a few years in behalf of these little friends we could with almost absolute assurance feel safe from insect pests, and instead of the croak of the frog there would come from the "orchard, the meadow and the deep-tangled wildwood, melodies which would excel that of the babbling brooks," styled by poets as Nature's sweetest music.

If protection is not given the birds, in a few years there will come from our woodlands and forests a deathlike silence. The boll weevil, potato beetle, grasshopper and all other insect enemies of the field and orchard will march unchecked and unhindered, doing damage equal to that of all the droughts, floods, cyclones and tornadoes.

Think about it. This is no idle dream. Let us no longer stain ourselves with the destruction of these little creatures "God Almighty gave to bless the lives of men." "It will soon be too late to repine—the moving finger writes; and having writ moves on; nor all your piety nor wit shall lure it back to cancel half a line, nor all your tears wash out a word of it."

In future articles on this subject I shall give reports from Farmers' Bulletins Nos. 506 and 513, which will prove conclusively the economic value of different birds.

COWPEA GOOD AS EGG FOOD.

Cowpeas are not only relished by hens, but are excellent egg food for them. One successful poultryman gives this experience: The peas, after maturing, were harvested and stored in dry lofts, and thrown to the fowls in scratching pens, where they were scratched over and searched for during the day.

After a few days the egg supply was visibly increased, and within a few weeks almost doubled that from an equal number of hens kept in separate quarters and fed on other grains. The hens seemed to like the small branches and leaves, and would eat every particle except the hard, stiff stems.

The general health of the flock was excellent, and not a single hen showed the least symptom of ailment during the winter season. Considering the ease with which cowpeas may be raised, it seems that everyone should give them a test as food for the poultry.

THE USE OF COMMERCIAL FERTILIZERS.

BY CAPT. T. F. PECK, COMMISSIONER OF AGRICULTURE.

Complaints from users of commercial fertilizer that they did not get the results they expected are numerous, and the user thinks it is all because the fertilizer is not what the manufacturers claim for it. In some cases this might be true, but in the majority of cases it has been found that the user was to blame. Fertilizers can be intelligently used with profit. While this is true, many thousands of tons are used in Tennessee each year without any profitable results to the crops and in some cases a direct loss, while in either case the fertilizer with intelligent use under proper conditions would have given satisfactory results.

Users of commercial fertilizers have noticed when turning land in the fall that it has been worked in some summer crop and fertilizer had been used in the drills, the fertilizer would be found undissolved in the drills after the growing season when the fall turning was done. That undissolved fertilizer did the crop grown no good and it is probable that want of moisture caused the fertilizer to cause the plant leaves to fire.

No doubt the fertilizer had all the plant food in it that was claimed for it, but there was not enough moisture in the soil to make the plant food available for the plant. I have in former "Talks to Farmers" explained how the plants take up their food through the little hairy roots they send out to hunt for it. These roots will not penetrate dry clods and extract unavailable plant food. Their food must be in liquid form. There must be moisture in the soil to make it available.

Now, farmers, there are a few simple things you must know and that you can easily understand to get the value of your money put in fertilizer for plant food. First, we must have moisture for the plant during the growing season. We can have an abundance of moisture any season for any crop if we will begin in time. We cannot get it so long as we plow from two to four inches. You must have a reservoir to hold the moisture. A deep soil with an abundance of vegetable matter in it makes the best reservoir. You know where land has been plowed shallow for years a hard pan forms under the loose soil that rain will not penetrate, so when the few inches of soil get wet the surplus water runs off and takes with it your plant food. If we want to use commercial fertilizers profitably we must have moisture and we need only apply fertilizer in proportion to the moisture to make it available. Now is a splendid time to plan for fall work. If you

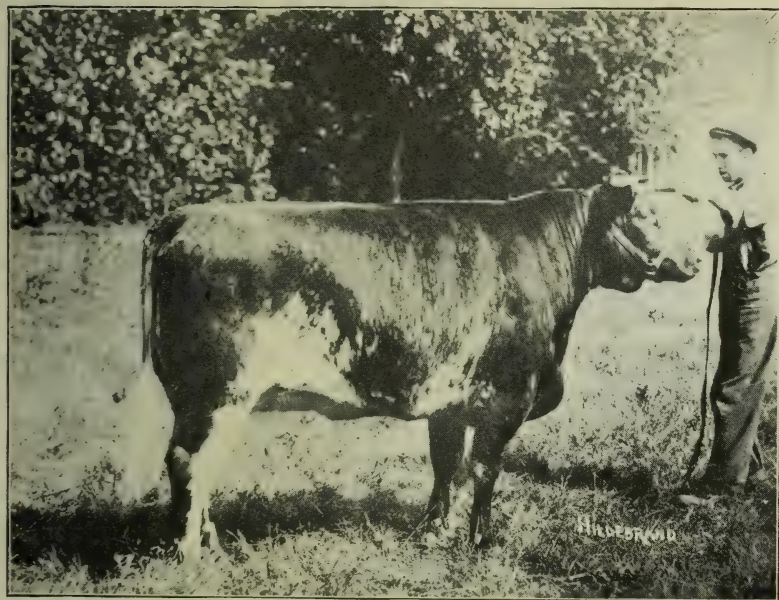
will select now the land for next summer's money crops, get some peas or soy beans on the land this summer; at the right time this fall, turn under the green crop and follow in the furrow of the turning plow with a subsoil plow; if you can do this in time to prepare the ground and put in a cover crop for winter, do so. In the spring turn under the cover crop, and as you do so keep the pulverizing harrow close up with the plow; do not let your ground dry out cloddy. Keep pulverizing the soil until you get a good seed bed. If you use commercial fertilizers, begin with a small amount per acre and you can increase the amount per acre as you get more vegetable matter (humus) in your soil to hold the moisture to dissolve the plant food in the increased amount of fertilizer.

The Department of Agriculture is looking after the manufacturers of commercial fertilizers to keep the quality of their product up to their claim for it, and we are succeeding well, but our most important duty is to get the farmer to understand how to get his soil in the right condition to get the full value in his crops when he uses commercial fertilizers, and if he does not, to get his soil in condition to make available the plant food locked in it. The farmer must be able to store up moisture in his soil for his crops. He can do so by plowing deep, subsoiling, turning under vegetable matter, keeping a winter cover crop, thorough preparation of his seed bed, and through often, shallow cultivation. If the farmer will do these things he will make good crops, and I doubt if he will find much cause for complaint at the quality of his fertilizer.

COLD-STORAGE TESTS.

Tests of cold storage, as made by one of the experts of the Department of Agriculture, led to the conclusion that poultry keeps better when not drawn than it does when drawn. The reason is that the process of drawing causes bruises which invite the lodgment of germs. Birds that were dry picked kept much better than those which had been scalded. The experts summed up the requirements as prompt storage, dry picking and dry chilling. These essentials have all been favorable to the cold-storage trade, but seem never to be comprehended by the host of agitators which every year try to secure absurd cold-storage laws.

Poultry raising offers to women an excellent means of making money because the work is not too taxing for their strength.



First Prize Two-Year Old Shorthorn Heifer. Property of Lespedeza Farm, Hickory Valley, Tenn.



Archer's Lilac; Shorthorn Cow. Lespedeza Farm, Hickory Valley, Tenn.

HINTS TO POULTRY RAISERS.

BY HARRY M. LAMON, SENIOR ANIMAL HUSBANDMAN IN POULTRY INVESTIGATIONS, ANIMAL HUSBANDRY DIVISION, BUREAU OF ANIMAL INDUSTRY.

SELECTION OF A BREED.

Be sure that the male at the head of the flock is pure bred.

The Mediterranean or egg breeds are: Leghorns, Minorcas, Spanish, Blue Andalusians and Anconas.

The American or general purpose breeds are: Plymouth Rocks, Wyandottes, Javas, Dominiques, Rhode Island Reds and Buckeyes.

The Asiatic or meat breeds are: Brahmas, Cochins and Langshans.

The English breeds are: Dorkings, Orpingtons and Redcaps.

For farm use the American breeds are probably the best.

Purebred poultry means uniformity of products.

Uniformity of products means increased profits, if products are properly marketed.

Given the same care and feed, purebred fowls will make a greater profit than mongrels.

Subscribe for a good poultry paper.

Every poultry keeper should have a copy of the American Standard of Perfection. (This is the official standard of the American Poultry Association and may be obtained from the Secretary, Mr. S. T. Campbell, Mansfield, Ohio.)

ARTIFICIAL AND NATURAL INCUBATION AND BROODING.

Have everything ready beforehand and start your hatching operations early in the year.

A well-ventilated cellar is the best place to operate the incubator.

The machine should be operated according to the manufacturer's directions.

See that the incubator is running steadily at the desired temperature before filling it with eggs. Do not add eggs to a machine during incubation.

Turn the eggs twice daily after the second and through the eighteenth day. Cool the eggs once daily, according to the weather, from the seventh through the eighteenth day.

Turn the eggs before caring for the lamp.

Attend to the machine carefully at regular hours.

Keep the lamp and wick clean.

Test the eggs on the seventh and fourteenth days.

Do not open the machine after the eighteenth day until the chickens are hatched.

Eggs saved for hatching purposes should not be subjected to high or low temperatures.

In cold weather place from 10 to 13 eggs under the hen; in warm weather from 13 to 15.

Always test the hen on china or nest eggs before setting.

Given proper care and attention, the hen is the most valuable incubator for the farmer.

Use insect powder freely to exterminate lice when necessary.

February, March and April are the best months for hatching.

If several hens are set in one room, it is desirable to confine them in good nests.

Straw and hay make good nesting material.

Broody hens should be moved to the permanent sitting nest at night.

Whole corn is a good feed for sitting hens. Water, grit and dust baths should also be provided.

All eggs should be tested by the seventh day, which often makes it possible to reset some of the hens.

Toe-mark the chicks as soon as they are hatched. This enables one to tell their ages later.

Powder the chicks occasionally during the first eight weeks.

Start the brooder a day or two before putting in the chicks to see that the heating apparatus is working properly.

Brooder lamps should be cleaned every day.

A record should be kept of each hatch, showing the date set, number and kind of eggs, number tested out, and the chickens hatched.

Chicks should not receive feed until they are thirty-six hours old.

In cool weather ten to thirteen chicks are sufficient for one hen, while in warmer weather fifteen to twenty can be cared for successfully.

Never mix chicks of different ages.

Confine the hen until the chicks are weaned.

The coop for hen and chicks should be well ventilated, easy to clean, and of sufficient proportions to insure comfort.

The early hatched pullet is the one that begins to lay early in the fall, when eggs are high in price.

The cockerel that can be marketed as a broiler in March or April brings more money than the one marketed in June.

POULTRY HOUSES AND FIXTURES.

Select a location that has natural drainage away from the building.

A dry, porous soil, such as sand or gravelly loam, is preferable to a clay soil.

In most localities the building should face the south, as this insures the greatest amount of sunlight during the winter.

Allow at least two square feet of floor space per bird.

Proper ventilation and sunlight mean a dry house and healthy birds.

The partial open-front house is conceded to be the best type for most sections.

The colony plan of housing poultry may be adopted to good advantage on many farms. This system does away with the danger of tainted soil.

The roosts should be built on the same level, two feet six inches from the floor, with a dropping board about eight inches below them.

Good roosts may be made of two by two inch material with upper edges rounded.

The nests may be placed on the side walls or under the dropping boards. It is best to have them darkened, as the hens prefer a secluded place in which to lay.

FEEDING.

In order to obtain eggs it is necessary to have healthy, vigorous stock, properly fed.

Nature provides—	Scientific classification	Poultrymen feed—
Worms and bugs -----	Nitrogenous material or protein	Eggs, meat (green cut bone or beef scrap), milk or cottage cheese.
Seeds -----	Nonnitrogenous -----	Wheat, oats, corn, barley, etc.
Greens -----	Succulents -----	Lettuce, cabbage, kale, mangels, alfalfa, clover, sprouted oats, etc.
Grit -----	Mineral matter -----	Grit and oyster shell.
Water -----	Water -----	Water

A splendid mixture for laying hens is equal parts of cracked corn, wheat, and oats, which should be scattered in the litter.

Bran or middlings and beef scraps should be kept in receptacles to which the fowls have access at all times.

Plenty of exercise increases the egg yield.

Provide four or five inches of good, clean litter in which to scatter the grain.

Cabbages, mangels, potatoes, sprouted oats, etc., make excellent green feed.

When wet mashies are fed, be sure they are crumbly and not sticky.

For the first three days chicks may be fed a mixture of equal parts of hard-boiled eggs and stale bread, or stale bread soaked in milk. When bread and milk are used, care should be exercised to squeeze all milk out of the bread. From the third or fourth day until the chicks can eat wheat and cracked corn, commercial chick feed is a good ration.

Plenty of pure, fresh water, grit, shell, and green feed should be available from the first day.

There is very little danger of overfeeding young stock.

Feed the chickens about five times daily and only what they will eat up clean in a few minutes, except at night, when they should receive all they want.

EGG PRODUCTION.

Produce the infertile egg. (See Rule 5, last page.)

Infertile eggs are produced by hens having no male birds with them.

Removing the male bird has no influence on the number of eggs laid by the hens.

The hen's greatest profit-producing period is the first and second years, and unless a hen is an exceptionally good breeder she should be disposed of at the end of her second laying season and before starting to molt.

Few eggs can be expected until the pullets are matured.

If possible, mark the pullets that lay in the fall, and use them in the breeding pen for the following spring.

Soft-shelled eggs are often caused by fowls being confined, becoming overfat, and from lack of mineral matter.

MARKETING.

Uniform products command the best prices. Purebred fowls produce uniform products.

Begin marketing the cockerels as soon as they weigh one and one-half pounds or attain a marketable weight.

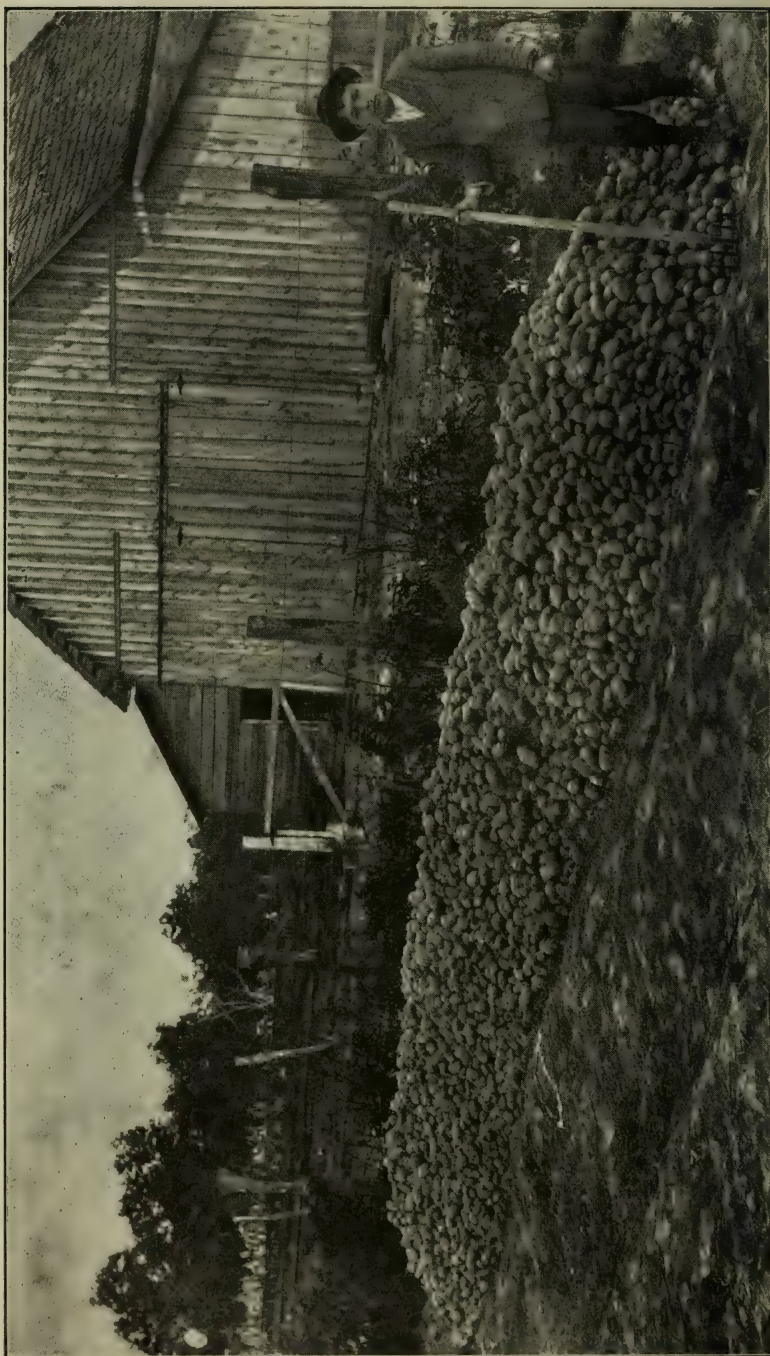
Market white-shelled and brown-shelled eggs in separate packages.

When selling eggs to the country merchant or cash buyer, insist that the transaction be on a quality basis.

Ship or deliver eggs twice or three times weekly.

Small or dirty eggs should be used at home.

When taking eggs to market they should be protected from the sun's rays.



190 Bushels of Potatoes, Grown on One-half of Acre by a Cumberland County Potato Club Boy.

Infertile eggs will withstand marketing conditions much better than fertile eggs.

LICE AND MITES.

The free use of an effective lice powder is always in order.

A dust bath is very essential in ridding the fowls of lice.

In applying powder hold the fowl by the feet, head down, and work the powder well down into the feathers.

The free use of kerosene on the roosts and in the cracks will exterminate mites.

COMMON DISEASES AND TREATMENT.

All diseased birds should be isolated.

Colds and Roup.—Disinfect the drinking water as follows: To each gallon of water add the amount of potassium permanganate that will remain on the surface of a dime.

Canker.—Sprinkle a little flowers of sulphur in the mouth and throat of the bird, and put some chlorate of potash in the water. Also carefully remove the exudate with the aid of warm water and apply a 2 per cent solution of creolin to the diseased tissue.

Chicken Pox.—Apply a touch of iodine and carbolated vaseline to each sore.

Gapes.—New ground and vigorous cultivation will often remedy this trouble.

Scaly Legs.—Apply vaseline containing 2 per cent of creolin to the affected parts, and after twenty-four hours soak in warm soapy water. Repeat treatment until cured.

Diarrhea in Hens.—Low-grade wheat flour or middlings is good for this trouble. Also give teaspoonful of castor oil containing five drops of oil of turpentine to each fowl.

Bowel Trouble in Chicks.—Well-boiled rice mixed with a little charcoal will often check this complaint. Dissolve fifteen grains of crude catechu in each gallon of drinking water.

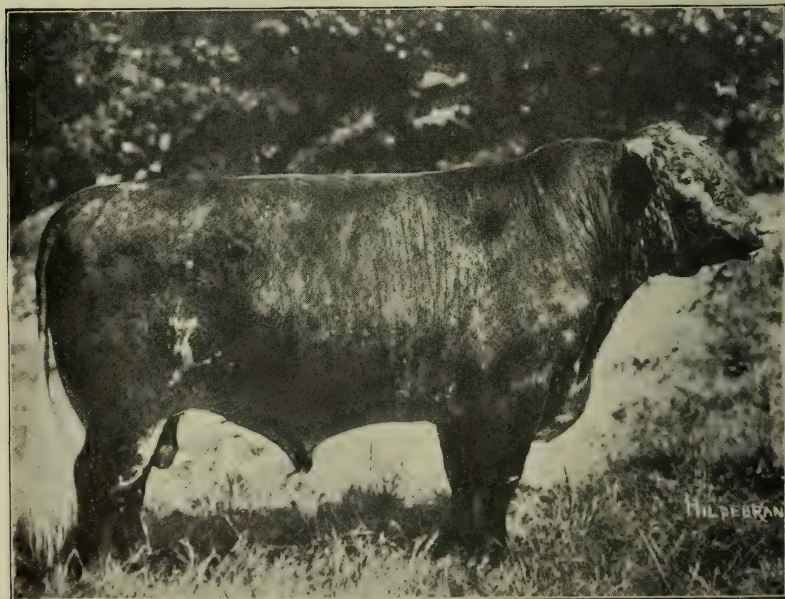
RULES.

It is urged that all farmers and poultrymen adhere strictly to the following rules in handling their poultry and eggs:

1. Keep the nests clean; provide one nest for every four hens.
2. Gather the eggs twice daily.
3. Keep the eggs in a cool, dry room or cellar.
4. Market the eggs at least twice a week.
5. Sell, kill or confine all male birds as soon as the hatching season is over.

FAIR DATES FOR 1913.

Postoffice.	County.	Dates.	Secretary.
Alexandria	DeKalb	Sept. 4-6	Rob Roy.
Coal Creek	Anderson	Sept. 23-25	W. L. Wilson.
Concord	Knox	Sept. 9-12	F. H. Boring.
Cookeville	Putnam	Aug. 28-30	A. P. Barnes.
Columbia	Maury		H. W. Thomas.
Deer Lodge	Morgan	Sept. 23-26	T. F. Hayworth.
Fayetteville	Lincoln	Aug. 27-29	F. M. Bledsoe.
Gallatin	Sumner	Aug. 28-30	W. Y. Allen.
Humboldt	Gibson	Sept. 17-20	C. W. Rooks.
Jackson	Madison	Sept. 30-Oct. 4	W. F. Barry.
Kingston	Roane	Sept. 30-Oct. 3	S. R. Sparks.
Lewisburg	Marshall		C. C. Wallace.
Memphis	Shelby	Sept. 22-27	F. D. Fuller.
Morristown	Hamblen	Sept. 3-5	C. B. Weesner.
Murfreesboro	Rutherford		B. B. Kerr.
NASHVILLE			
(State)	Davidson	Sept. 29-Oct. 4	J. W. Russwurm.
Newport	Cocke	Aug. 26-28	Jno. M. Jones.
Paris	Henry	Oct. 8-11	R. H. Hudson.
Rhea Springs	Rhea	Oct. 6-11	H. B. Payne.
Rome	Smith	Aug. 14-16	A. T. Williams.
Selmer	McNairy	Oct. 14-17	W. K. Abernathy.
So. Pittsburg	Marion	Oct. 14-17	W. H. Wilson.
Spring City	Rhea	Oct. 7-11	J. W. Fischesser.
Sweetwater	Monroe	Sept. 16-19	Jas. R. Love.
Tullahoma	Coffee		John W. Harton.
Union City	Obion	Sept. 10-14	J. W. Woosley.
Winchester	Franklin	Sept. 2-5	T. B. Anderton.



Imperial Gloster. Shorthorn Bull. Lespedeza Farm, Hickory Valley, Tenn.

MAY CROP REPORT.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., June 1, 1913.**

Reports from crop correspondents in eighty-eight of the ninety-six counties in the State show prosperous conditions and indications of one of the best crops the farmers of the State have ever harvested.

The conditions for the preparation of the ground and planting the crops have been good. There has been an ample rainfall, well distributed over the State. The wheat crop will equal, if not surpass, that of last year, and corn is doing well.

Cotton is somewhat late, but is showing a good stand. Pastures are in extra good condition, and live stock is doing well all over the State with the exception of hogs, among which cholera is prevalent in many sections of the State.

The acreage in tobacco will probably be about the same as 1912, and the condition of the crop in the large tobacco-growing counties is reported good.

In the trucking sections of the State fine crops of strawberries have been harvested and fairly good prices have been realized.

The fruit production will not equal that of last year, but will be better than an average for the State.

In the peanut-growing counties the acreage is reported up to the average.

The acreage in Irish potatoes will show an increase, and prospects are good for a larger harvest.

Below is given the summary for comparison of the report of the Department for the years 1912 and 1913:

	1912.	1913.
Cotton, acreage	75	91
Cotton, condition	61	77
Wheat, condition	76	83
Garden, condition	80	85
Oats, condition	84	75
Young Clover, condition	85	76
Meadow Grasses, condition	86	77
Corn, acreage	80	96
Corn, condition	70	85
Tobacco, acreage	79	74
Tobacco, condition	73	78
Apples, condition	69	61
Peaches, condition	87	59
Grapes, condition	85	81
Irish Potatoes, acreage	84	93
Irish Potatoes, condition	81	84
Tomatoes, acreage	85	90
Tomatoes, condition	81	81
Peanuts, acreage	80	86
Live Stock, condition	85	90
Alfalfa, condition	83	85

JUNE CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Cotton—acreage.	Cotton—condition.	Wheat—condition.	Garden—condition.	Oats—condition.	Young Clover—condition.	Meadow Grasses—condition.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Tobacco—condition.	Apples—condition.	Peaches—condition.	Grapes—condition.	Irish Potatoes—acreage.	Irish Potatoes—condition.	Tomatoes—acreage.	Tomatoes—condition.	Peanuts—acreage.	Live Stock—condition.	Alfalfa—condition.
A Alluvial Plain of the Mississippi River and Plateau Slope of West Tennessee.	Lake	90	..	65	80	..	90	90	100	80	90	90	..	..	..	..	..	..	..	..	..	..
	Obion	95	90	75	80	70	60	80	95	95	..	..	80	90	80	90	75	90	85	100	100	80
	Dyer	95	85	75	85	60	80	90	95	75	..	..	60	75	80	100	100	100	100	100	95	95
	Laurel	90	85	85	90	75	95	95	95	85	..	..	50	90	90	90	75	75	75	95	95	95
	Tipson	95	80	65	80	70	85	95	100	75	..	..	..	90	80	95	85	..	..	..	95	90
B Brown Loam Tablelands, Middle Counties of West Tennessee.	Shelby	100	100	100	100	100	100	100	100	100	..	..	..	..	..	100	100	..	..	..	100	..
	Weakley	100	80	70	75	55	60	45	100	80	90	85	70	80	85	100	90	95	80	..	85	75
	Gibson	100	90	75	90	85	85	85	100	95	..	..	85	80	85	95	90	75	95	..	85	95
	Crockett	90	75	..	80	60	60	90	100	70	..	..	40	60	80	80	75	75	60	..	85	..
	Madison	95	90	100	100	100	100	100	95	95	..	..	90	80	100	100	100	100	100	..	95	100
C Summit Region of Watershed, West Tennessee.	Haywood	100	75	..	90	85	100	100	100	75	..	..	80	50	100	100	80	100	100	..	100	..
	Hardeman	95	50	60	95	60	85	90	100	85	..	..	80	35	..	50	90	95	95	..	95	..
	Fayette	100	75	100	95	90	..	..	100	90	..	..	80	90	..	90	95	..	..	..	95	..
	Henry	90	70	85	85	85	85	85	95	95	100	100	45	50	85	90	100	100	100	100	95	75
	Carroll	95	50	75	95	80	75	75	100	85	100	100	85	..	..	..	..	..	..	..	95	..
D Valley of Tennessee River, West and Middle Tennessee.	Henderson	100	90	80	90	90	90	100	100	85	..	..	75	75	..	..	80	..	..	..	100	..
	Chester	100	80	..	..	85	..	90	100	80	..	..	..	..	65	75	..	..	40	..	80	..
	McNairy	80	..	..	75	80	..	75	85	..	..	..	..	..	..	..	..	..	..	..	..	..
	Stewart .....	..	80	90	90	75	100	90	100	95	80	90	100	100	100	100	..	..	..	..	95	..
	Benton	75	..	80	60	70	90	70	90	75	100	100	30	25	..	..	..	..	..	..	30	..
	Houston .....	..	..	80	85	70	75	75	100	90	100	95	80	100	100	100	85	100	85	95	80	85
	Humphreys .....	..	..	65	70	60	40	50	90	70	60	50	50	90	80	90	80	70	65	75	100	..
	Decatur .....	..	..	80	80	90	..	85	100	90	..	..	60	100	100	100	80	75	100	100	90	..
	Perry .....	..	..	75	75	75	75	75	100	90	75	100	55	90	100	100	75	75	75	100	90	..
	Hardin	70	60	85	85	..	..	..	95	95	..	..	..	..	..	80	75	..	..	..	95	..

E Highland Rm of Middle Tennessee, Western Subdivision.	Montgomery	95	90	65	75	80	75	80	75	60	25	50	50	60	100	90	90	100	100
	Robertson	80	80	75	60	50	50	50	100	90	100	75	85	60	50	100	100	85	100
	Cheatham	100	80	85	60	50	50	50	100	100	95	100	100	100	100	100	75	100	100
	Dickson	100	80	85	60	50	50	50	100	100	95	100	100	100	100	100	75	100	100
	Hickman	100	80	85	60	50	50	50	100	100	95	100	100	100	100	100	75	100	100
	Lewis	100	80	85	60	50	50	50	100	100	95	100	100	100	100	100	75	100	100
	Wayne	100	80	85	60	50	50	50	100	100	95	100	100	100	100	100	75	100	100
	Lawrence	100	80	85	60	50	50	50	100	100	95	100	100	100	100	100	75	100	100
	Macon	80	70	60	50	50	50	50	100	100	95	100	100	100	100	100	75	100	100
	Clay	80	70	60	50	50	50	50	100	100	95	100	100	100	100	100	75	100	100
F Highland Rm of Middle Tennessee, Eastern Subdivision.	Pickett	75	90	100	95	90	100	100	100	100	100	100	100	100	100	100	100	100	100
	Overton	75	90	100	95	90	100	100	100	100	100	100	100	100	100	100	100	100	100
	Jackson	90	100	80	80	100	100	100	100	100	95	25	60	50	40	100	90	90	90
	Putnam	90	95	80	85	100	100	100	100	100	95	25	60	50	40	100	90	90	90
	DeKalb	95	95	80	85	100	100	100	100	100	95	25	60	50	40	100	90	90	90
	White	95	95	80	85	100	100	100	100	100	95	25	60	50	40	100	90	90	90
	Warren	70	75	70	60	60	60	60	70	75	90	80	85	70	40	95	100	80	100
	Coffee	85	90	80	90	80	80	80	100	85	100	100	100	100	100	100	80	100	100
	Franklin	90	90	75	70	85	100	100	100	90	85	45	30	95	100	80	80	100	100
	Sumner	90	85	70	75	70	75	70	90	90	80	85	80	75	90	90	90	90	95
G Central Basin.	Trousdale	80	85	65	65	75	100	85	85	85	80	100	75	65	100	80	100	100	100
	Smith	80	85	65	65	75	100	85	85	85	80	100	75	65	100	80	100	100	100
	Davidson	80	60	60	50	50	75	80	75	80	40	70	60	60	80	60	80	50	80
	Wilson	75	100	75	85	75	100	100	100	100	100	100	100	100	100	100	100	100	100
	Williamson	85	70	60	75	75	100	85	75	100	100	100	100	100	100	100	100	100	100
	Rutherford	90	75	80	50	80	50	80	50	80	100	85	50	70	80	100	80	100	100
	Cannon	65	70	60	65	85	70	80	85	70	80	85	60	40	90	95	80	100	75
	Maury	90	95	50	50	80	90	100	100	100	80	85	80	40	75	90	80	100	100
	Marshall	75	85	70	80	80	80	85	90	85	80	100	60	70	70	90	90	100	100
	Bedford	100	90	75	60	75	100	70	70	70	85	100	50	50	100	90	100	100	100
H Cumberland Table- land.	Giles	80	85	80	80	90	90	80	85	85	85	85	65	50	95	90	100	75	90
	Lincoln	90	95	90	80	80	80	85	85	85	85	85	65	50	95	90	100	75	90
	Moore	75	90	70	85	75	95	90	90	90	75	75	75	70	90	100	85	100	100
	Scott	85	100	70	70	75	95	85	85	85	85	85	65	50	100	100	85	100	100
	Fentress	85	100	70	70	75	95	85	85	85	85	85	65	50	100	100	85	100	100
	Morgan	75	90	85	60	75	55	95	95	95	85	80	50	50	80	95	95	80	95
	Cumberland	80	80	80	75	85	80	80	80	80	85	85	45	40	80	65	85	85	75
	Van Buren	90	95	100	60	60	100	90	90	90	60	60	60	40	80	100	90	100	90
	Grundy	90	95	100	60	60	100	90	90	90	60	60	60	40	80	100	90	100	90
		90	95	100	60	60	100	90	90	90	60	60	60	40	80	100	90	100	90

JUNE CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.															Cotton—acreage.	Cotton—condition.	Wheat—condition.	Garden—condition.	Oats—condition.	Young Clover—condition.	Meadow Grasses—condition.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Tobacco—condition.	Apples—condition.	Peaches—condition.	Grapes—condition.	Irish Potatoes—acreage.	Irish Potatoes—condition.	Tomatoes—acreage.	Tomatoes—condition.	Peanuts—acreage.	Live Stock—condition.	Alfalfa—condition.																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																				
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IN THIS ISSUE:

Problems of Life on the Farm. For Better Farming.

County Institute Work.

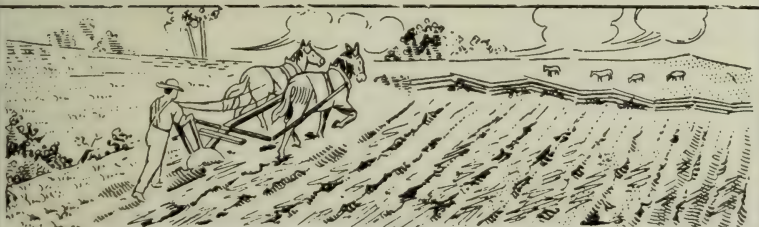
The Kind of Education That Will Help Solve Farm Questions

Progressive Farming. The Business Farmer.

How to Control Diseases of Swine, Sheep and Cattle.

How to Grow Clover and Alfalfa.

June Crop Report.



TENNESSEE AGRICULTURE

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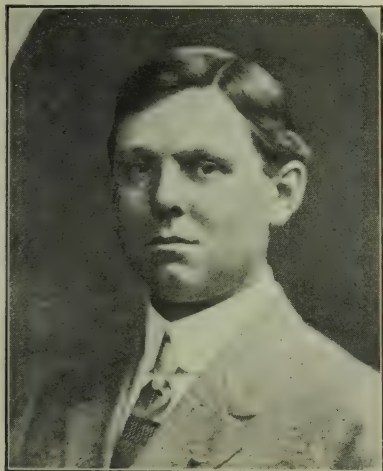
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PROBLEMS OF LIFE ON THE FARM.

ADDRESS OF W. B. STOKELY, PRESIDENT OF EAST TENNESSEE FARMERS'
CONVENTION AND INSTITUTE.



Farmers of East Tennessee: God has richly blessed us, in giving us a fertile as well as the most beautiful country in the world. Our natural opportunities for health, wealth and happiness are boundless. But have we done, or are we doing, our part?

It is true that East Tennessee has made great progress in the science of agriculture during the last forty years, and it is also true that her farmers as a rule are doing better and more scientific farming now than the farmers of Middle and West Tennessee, which fact is due to the forty-year influence of this great convention and the teachings of this experiment station. But we must face the fact that we are not doing all we should. We owe a duty to our families, to our communities and to our State, to live up to our full opportunities. Men, let us get busy and resolve to take action now. We can't afford to wait and drift. Our present status is such as calls for immediate action.

According to the last census report the rural population of Tennessee decreased 50,000 in ten years. What became of those 50,000 people that left the country? They went to the cities and towns. Why did they go? In search of better school facilities and greater social opportunities. As a result the country loses its most progressive families and 50,000 producers become consumers only.

Another great menace to our country life is that 41 per cent of all the farms in Tennessee are lived on and operated by tenants. And tenancy is on the increase today. Tenants are hurtful to a community in that they have no permanent interest in school, church or the fertility of the soil.

How are we to remedy these great evils? Let us today fix for ourselves some future ideals and strive with all our might to attain them. We must bring the rural schools to the front. Take the district school twenty-five years ago—a log house with slab benches for

seats and a four months' term. Today we have better houses and some desks and still a four months' term. I am certainly glad our school term gets no shorter.

This is a day of preparation. If we would have our children do things well we must teach them, give them special preparation for their occupation. We would not think of attempting to practice law without first making a study of that subject, or of practicing medicine until we had made a study of that science. It is even more important that we make a study of the science of agriculture if we would be good and successful farmers. Therefore, let's begin making farmers of our boys by teaching them agriculture in the rural schools. We can do this by having more efficient rural teachers and a county adviser in agriculture. This adviser could have a demonstration plot in every school community, which would not only cause the children to become interested in plant life, but would soon have every farmer in the community interested and a student of agriculture. Of course all this would cost money, but are we not entitled to just as good schools as the cities and towns? It depends on us farmers to get these schools. Are we going to grasp the opportunity? It behooves us to be up and doing. Accomplish this and then we would see our college of agriculture full of the brightest of boys, eager to learn all they can about the science of agriculture. It takes our brightest boys to succeed as farmers. Such boys as are deficient in energy and intellect to such an extent that they will not and cannot make successful farmers should be allowed to go to the cities and become doctors, lawyers and politicians.

The greatest fault of our present system of farming is that we all want to be big farmers; we try to cultivate every acre possible; we are extensive farmers. We call a man who operates hundreds of acres a big farmer, and one who operates only a few acres a small one. The true or ideal standard to measure a farmer by is not by the number of acres he operates, but by the yield he reaps per acre.

The best and biggest farmer is the one who makes every acre produce its highest possible yield, whether he cultivates hundreds of acres or only one. What we must accomplish is higher production, and the way to accomplish this is by intensive or better farming. There is no doubt that we farmers are the most wasteful business people on earth. We fail to make our land produce anything like what it is capable of giving us. We abuse our soil by growing the same crops year after year. We fail to study as we should the great problem of soil fertility. Yes, we are more than wasteful; we are robbers; we

rob our soil of its fertility and in doing so rob ourselves and future generations of the good things of life. Let's quit the practice of always taking from and never giving to our lands. We must conserve our soil fertility. It is vital. It is the capital stock in the business of farming.

The wonderful records of some of the Corn Club boys, growing over two hundred bushels of corn on one acre, is a fine illustration of the result of intensive farming. Though our East Tennessee Corn Club boys have not reached the two hundred bushel stage yet, they have made a fine beginning. Many of them made over a hundred bushels on their acre last year. How many of you big farmers averaged one hundred bushels of corn to the acre on your last year's crop? Not one of you. Oh, boys! if you only teach the farmers of East Tennessee what intensive farming will do, you have done a great and good work. Let us take a lesson from our boys and do more scientific and better farming. Of course it will take time to get every acre on the farm up to the standard of the boys' one acre, but we should not be satisfied until every acre is giving us its best. So, instead of taking every dollar we can scare up and buying more land, let's use the money to make the land we have produce double what it has been producing. It is possible, men. Let's get busy and see what we can do.

It is more profitable to cultivate fifty acres well and increase the fertility of the soil than to half farm a hundred acres. My ideal of a farm is one in which every acre is in a high state of cultivation and paying a dividend, with no waste or thrown out fields. Some of you might think that is impossible, but it is not. If we have places that won't grow corn, clover, alfalfa or grass, let's try growing trees for posts or lumber and if they will not grow, try blackberries.

This convention has a plan for growing alfalfa and one for getting and maintaining stands of red clover which various speakers will tell us about later. Why not have a plan for making our farms better and better farmers of us. The first step in improving our land if it is inclined to be wet is to thoroughly drain it. The life of all land depends upon proper drainage. Lime it if it is sour and put plenty of humus or vegetable matter in the soil. We can do this by turning under some legume crop, such as clover, peas or beans, and we should always have a green cover crop on our fields during the winter. Rye, barley and crimson clover are good, and by turning these under in the spring we will keep plenty of humus in the soil. We cannot take heavy crops off our land every year and conserve our soil fertility,

unless we give something back to the soil. The ideal way to accomplish this is to grow lots of live stock of some kind and feed our crops on the farm, for barnyard manure, in my opinion, is the greatest and best soil builder and plant food in the world. Right here I want to caution every farmer to look close after the barnyard manure and properly apply it, for it is money to you. It is the most valuable product of the farm.

The old idea that one mule is sufficient to properly cultivate twenty-five acres or four mules to the hundred acres is out of date; it is no good. To do intensive farming we must have plenty of power and the best of farming implements. How many of you are working from \$800 to \$1,000 worth of mules to a wornout disc harrow? A new one would cost only \$30 or \$40 and do twice as good work. Is that economy? Farmers, look to your tools.

The most important step in growing any crop is the preparation of its seed bed, for we cannot expect any plant to grow and do its best unless it has the proper food when it is little. We all will agree that the first step in preparing for a crop is to break the land thoroughly and deep and then cultivate the surface until we have the finest of seed beds. We do too little work on our land before planting or sowing our crops, and then we still work too little. If we would reap a big yield we must work and work and continue to work.

When we have made our crop it is up to us to market it to best advantage. How can we increase our markets? By the finishing of farm products on the farm. This will give us a number of markets to choose from. Take corn for instance. If the dealer offers too low a price for it we can finish our cattle with it and sell it as beef, or we can feed it to hogs and sell it as bacon, or feed it to cows and sell it as butter, cream or milk, or market it by feeding to horses and mules, or market it in poultry products. So you see we need not be entirely at the mercy of the grain dealer, for we can find various ways to cash our farm products right on the farm. The middleman, that is, the man who is between the producer and consumer—is glad to fix the price of our farm products for us and will continue to do so as long as we drift along and allow it. But are we going to continue to stand for it? Can we afford it, when we are able to so increase our markets at our own will? By the proper study of this great problem of marketing our farm products and by hearty co-operation we can to a great extent fix our own prices.

I want to especially call your attention to the great importance of feeding out or finishing our beef cattle here in East Tennessee. We

have been letting Virginia and Kentucky come and take them away just at the time we ought to keep them. Of course we have not the fine bluegrass sods to finish them on which they have, nor ever will have as long as we let them have our cattle to enrich their soils and themselves at our expense. We can grow just as good bluegrass and just as good anything else here in East Tennessee as they can if we will properly treat our soils. And the way to accomplish it is to grow lots of cattle and feed out and finish more cattle. Save all the barnyard manure and properly apply it to the soil. When we do this our soils will be fertile and with intensive farming we will be well on the road to success, with more farmers, better and happier farmers and better farms.

I want to emphasize the importance of better live stock for the farm. For it costs no more to grow and feed a good animal of any kind than it does a sorry one, and the good one will grow and increase in value much more rapidly than the one of poor quality. Then why waste time and feed with the poor ones? It is very necessary that we have good work stock suited to the work if we would do good farming, for we cannot economically prepare good seed beds with small and inferior work stock. They should be large enough to easily handle our heaviest farm tools, whether mules or horses. Our work stock should have good feed and plenty of it and the best of care. If we farm with brood mares it is doubly important that we have the breed and kind that is best suited to our work and whose offspring will bring us the most money. The farmer has been misled by fanciers. What we want is results; we want the beef animal that will give us the highest priced beef at the smallest cost, the dairy cow that will produce the most butter fat, the hog that will give the best results and the hen that will lay the most eggs. We don't care about the curl of her feathers or how many combs she has—we want eggs.

Let us look close after our live stock and know the ones that pay and weed out the ones that do not, ever striving to raise the standard.

After we have made our farm ideal by making our soil fertile, by stocking it with ideal live stock and doing better farming, have we done our whole duty or lived up to our full opportunities? No, we have only begun—we have a higher duty to God, who has so richly blessed us, to our families, to our neighbors and to ourselves. It has been said that, with few exceptions, the country churches belong to one of three classes—the sick, the dying and the dead. If this be true of the country churches, whose fault is it? Our own,

of course. It is our highest duty to help make our own church an ideal country church. The church is the source of our spiritual or Christian life, upon which all true happiness depends. Show me a community without a church and I will show you one dead spiritually, rotten morally and with no progressive farmers. The ideal church in a community will pay spiritually, morally, socially and financially. In fact, looking at it from any standpoint, we cannot afford to live in a community that has no church or where the church is sick, dying or dead. How can we secure the ideal church? By giving more generously of both our time and money to this great cause. By building better church buildings and paying liberally the best and most efficient preachers to give their lives to this great work among us.

To keep pace with better farming and better churches we must have better schools—better houses with better school equipment, much longer terms and above all more efficient teachers. We want teachers properly trained and able to interest our children in things pertaining to rural life—and to teach them those things which will in after life make of them more useful citizens, better farmers and better home makers. The federal government and State both seem to be awaking to the fact that the country children are not getting the proper training in the public schools.

Now, country people, let's find out what we want and demand it, not be put off with things that are not adequate to our children's needs, for who should know better what training we need to help us solve the problem of rural life than we, who live in the country?

To attain all these good things we must have community cooperation. We can be of mutual advantage by working together in various ways. Our interests are the same and we should all work for the intellectual, social, moral and financial good of our community, for a band of workers can do more than any individual for the common good. An important factor in attaining these ideals is the building of good roads; in fact we cannot do without good roads—they are vital to a larger farm life.

I am glad that so many of our East Tennessee counties have seen the necessity and are now experiencing the benefits and pleasures of good roads. There is nothing we can spend money for that will give in return bigger dividends in increased business and pleasure. So, men, boost the building and maintaining of good roads in your counties, and if you once get some good roads you won't be satisfied until all your roads are good. Good roads are especially conducive to a higher social life in the country.

Farming has three sides to it—the industrial side, the business side and the social side. We are taking advantage of the modern science of agriculture and applying it to the industry of farming, and as a result are doing better farming. We are awaking to the fact that we have badly neglected the social side of farm life, the most important side of farming, for it is our life; it represents how we and our families are living. We must pay more attention to the social side of our lives and put an end to that dreary and dull existence which is so trying to our wives and daughters. Let's spend more money in better living. Life is short at the best; let us make the most of it. We must all work together to build up a social life in the country, which is more inviting than city life.

We should not attempt to make the country more like the city, but rather develop in the country the things of the country—things which the city cannot have. The ideal country church and school will help in developing this social side of life in the country.

The business or commercial side of farming is of vital importance to the farmer. The lack of business methods in caring for and disposing of the farm products and in buying the farm supplies accounts for more failures on the farm than any other cause, and is being less talked about. The colleges of agriculture are teaching intensive farming and how to produce big yields per acre. The government is organizing boys' corn clubs and inducing them to make big yields at a low cost per bushel. Counties, corporations and individuals are showing their generosity and interest by offering handsome prizes to the boy who raises the best ten ears of corn and the one who makes the biggest yield per acre. This is a public spirited and great thing for them to do, and will do a great deal of good and wonderfully increase the yield of corn all over the United States. But why not some one go farther and encourage the business side of farming and bring out and train the boy's business faculties by offering a prize to the boy who markets his corn in the most businesslike way and makes the most per bushel out of it? We must study the business problem in farming. If we are failures in the business side of farming we are failures in the other two also. Because if we are unable to market the products of our industry profitably we are unable financially for a social life.

We must use modern business methods in our farming, especially combination, where it is more profitable to sell or buy together than individually. Business as a rule now has to be done on a large scale to be done profitably. Therefore, it is imperative that we organize

business on a cooperative plan. There is a political reason for our cooperation and organization. Our political influence is small; we have been used by politicians, but have yet to learn how to use them.

We have not the influence on the policy of our State and nation that the importance of one industry demands. When a measure that affects any interest is before a legislature the spokesmen of that interest have more influence if they represent an organized body of men than if they represent an unorganized number. This convention should have a special committee for the purpose of looking after our legislative interest and seeing that we get needed legislation. We know more about what we need and want in the way of legislation than the politicians, and if we will make a combined effort and give our representatives to understand what we want and are going to have, we will get it. We farmers must cooperate, or, in plain language, stick together in everything, if we would succeed.

The whole solution of the problem of a successful life on the farm is to be found in better farming, better business and better living. Let us all accept as our ideal to which we will strive to attain the motto of this convention, "A larger life on better farms."

ADVANCE IN AGRICULTURE.

The advance made in agriculture in the United States has been slow, but there has been an advance. There are a good many people who can recall a time, within their memory, when very little attention was paid to the fertilization of the soil. Nothing worthy of mention was used except barnyard manure, and not one farmer in a hundred made any effort to use that well. About the only reason why most of them used it at all was to get rid of the accumulation about their barnyards.

Every farmer ought to have a neatly printed letterhead with envelopes to match. Advertise your business in every letter that you send out; it pays. If you have named your farm, put it in with your R. F. D., for that's your office. Let the people know who you are, where your place of business is and what you have to sell. If you are a breeder of fancy stock say so and tell them what your special breed is. If you grow anything that you are particularly interested in let the people know about it. A neat letterhead announcing your special line of whatever it may be will cause you to take more pride in that very thing yourself. Get to thinking about it at once and start out the new year right and see if it doesn't pay.

FOR BETTER FARMING.

COMMISSIONER T. F. PECK, BEFORE EAST TENNESSEE FARMERS' CONVENTION AND INSTITUTE.



"I have been attending this annual gathering of farmers for the past twenty-five years, and I have noticed the constant growth in interest, and I have seen the good resulting from them on farms all over East Tennessee. But I believe that interest in better farming has grown more in the past two years than for a like period in the past. I have been over a considerable portion of the State during the past six weeks, and I noticed better preparation of the land for crops than I have ever seen any season before. Farmers are using more cover crops of rye and crimson clover; they are plowing deeper, doing more subsoiling. They are taking more interest in the selection of the seed they plant than ever before. I see more heavy draft animals. Now, if they will keep up the good work by thorough, but shallow surface cultivation, there will be harvested this year the largest crop in the history of the State.

"The vegetable matter turned under with the deep tillage has prepared a reservoir for moisture, and made available the plant food. The constant stirring of the surface will conserve the moisture and the crops will get the benefit. We have made splendid progress, but there is still room for improvement with our progressive farmers. We still have too many who are drifting along in old ruts and letting the abundant rainfall that should be our greatest resource prove a positive detriment, as it will when land is plowed shallow. If the land is rolling and only a few inches of loose soil over the hard pan, you know what will happen when there is a heavy rain. The soil will get so full of water that it will float off and carry with it the plant food needed for crops. There is not a farmer present who does not know that it would not, if there were enough depth to the soil to take up the moisture. Every farmer here who has learned the valuable lesson of deep plowing and adding vegetable matter to his soil can render a valuable service to his neighbor, county and State by get-

ting the attention of his backward neighbor and showing him how easy and simple it is to prevent his land from washing; show him all the things he accomplishes by plowing deep in the fall, subsoiling and turning under vegetable matter and by thorough preparation of his seed bed, then by thorough, shallow cultivation. He prevents his land washing, he stores up moisture for his crop, making him independent of drouths, he makes available the plant food in his soil. He has conserved his moisture by constant thorough shallow cultivation and the shallow cultivation has given the plant food to the crops grown for profit rather than to weeds that could only be a detriment. Either advantage gained is worth several times the cost of the extra expense incurred.

"In planning for this institute we have tried to get as many of the bright young men to the meeting who expect to be farmers as possible. We want them to realize the great possibilities farming in Tennessee opens to them. With intelligence and energy given to farming in Tennessee, I am confident greater profits are possible than in any other vocation the young man can enter today. But, young men, I want to sound a note of warning. Time is precious. Others are learning of the great opportunities in farming in Tennessee because of our splendid soil, climate and rainfall, and people are coming here and buying land. You all know how land has advanced in price in the past few years. It will continue to advance. If you have not secured a farm, I would advise you to do so without delay. Find the soil and location you want and buy before it gets into hands that will hold on to it; do not buy more than you can work as it should be. Our farmers, as a rule, have tried to cultivate too much land. People who are interested in the agricultural development of the State will encourage the ownership of farms by those who will personally cultivate or direct the cultivation of their farms. Corporations are being formed to purchase farm land and cultivate it on a large scale. They can and will make it a success, but we will have a better citizenship and better rural life conditions if our farm lands are owned by the individuals who operate them. The farmer of today has much to encourage him to improve his methods. The departments of agriculture, State and federal, are working to help him. The State experiment stations are solving the problems in farming that confront him; the agricultural colleges are teaching the advanced science of farming in all its branches. The elementary and high schools are teaching the fundamental principles of agriculture. Farm demonstration work is being conducted with individual farmers. The railroads of the country are active in disseminating information by lectures, demonstra-

tions and furnishing transportation to farmers' institutes, etc. There have been formed home-makers' associations in each division of the State with branch organizations that will do a great work in improving rural life conditions to content the boy and girl on the farm. The movement for building good roads in the State will do a vast amount of good towards improving agricultural conditions. If you will travel over the State where there are good roads you will find good farming, more attractive homes, better schools and better churches.

"We must do our duty by the farmers of today who have been deprived of educational advantages, and have their obligations to their families that prevent them from acquiring an agricultural education such as we propose to give our boys and girls. We must help them along lines that will merge into their life work. For their benefit we have farmers' institutes, short courses in agriculture, demonstration trains, demonstration farms, State and county fairs. We can and must place the information before them in a way they can grasp it and apply it in their own work on their own farms. To offer them something out of their reach discourages rather than helps them. You have had opportunities that they have not. If you want to help your brother farmer you cannot do so by telling him to come up to the plane you occupy and you will help him. You must go to him and brush away the cobwebs of prejudice and superstition, the antiquated methods of a former generation and take him by the hand and by easy stages help him to climb to the plane you occupy. You will find he will gain confidence at every step.

"We must have our agricultural laws enforced to protect the farmers in their rights. This the department is trying to do by thorough inspection and strict business methods, and further by a campaign of education, both with the farmers as consumers and the producers of commodities the farmers buy. When the farmers are educated in what they have a right to expect they become our most efficient inspectors.

"I cannot close without expressing my appreciation of the splendid cooperation the newspapers have rendered in the campaign for a better rural life and the improvement of our farming industry. Brother Farmers, the newspaper, your home paper, gives you more real value for what you pay for it than any investment you make. Treat your paper fairly. It heralds your advent in the world, it records your achievements, gives you the news, boosts your section, leads in all public enterprises, molds public opinion, is one of your greatest educators. Do not neglect your home paper; it will even have a good word to say for you when you are dead.

"Another substantial friend to the farmer is the railroads. They bring the markets of the world within your reach, transport you and your products cheaper than any agency you can employ and they are active in the development of your section. Their policy is broad and progressive and I am glad to see that the farmers are less inclined to listen to the demagogue politician who is courting popular favor with his senseless tirade of abuse of the 'soulless corporation.' The railroads are spending more money to develop the agriculture of Tennessee than any other organization and should be given the credit they are justly entitled to.

"The future of the farmer in Tennessee is promising. If he will take as much interest in himself and his work as is being taken in him we will succeed. We must remember that others respect us and our vocation in proportion to the respect we have for ourselves and our vocation. I repeat, our opportunity is great. Let us prove we have the capacity to profit by the opportunity while it offers."

COUNTY INSTITUTES FOR MIDDLE TENNESSEE.

Assistant Commissioner of Agriculture Jesse Tomlinson has announced dates for holding county institutes in Middle Tennessee. The points selected for holding these institutes are places which were not reached by the Agricultural Special last year.

A large number of speakers will be present at these meetings, including Commissioner of Agriculture T. F. Peck, State Veterinarian Dr. Geo. R. White, Chief Feed and Seed Inspector A. L. Garrison, Apiary Inspector J. S. Ward, State Entomologist G. M. Bentley, and others.

Following are the places and dates of the institutes:

Waynesboro, Monday, August 18.

Linden, Wednesday, August 20.

Chapel Hill, Saturday, August 23.

Lafayette, Monday, August 25.

Gainesboro, Wednesday, August 27.

Celina, Friday, August 29.

Byrdstown, Saturday, August 30.

Jamestown, Monday, September 1.

Livingston, Wednesday, September 3.

Wodbury, Friday, September 5.

Spencer, Monday, September 8.

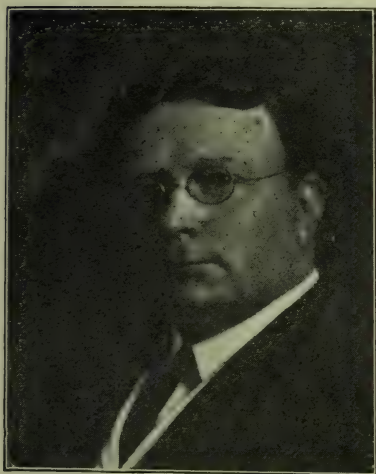
Tracy City, Thursday, September 11.

Crossville, Saturday, September 13.

Dover, Monday, September 15.

THE KIND OF EDUCATION THAT WILL HELP SOLVE FARM QUESTIONS.

PROFESSOR E. S. RICHARDSON, COLLEGE OF AGRICULTURE, LOUISIANA
STATE UNIVERSITY, BEFORE EAST TENNESSEE FARMERS'
CONVENTION AND INSTITUTE.



I feel honored to have the privilege of meeting and talking to the fortieth annual session of this splendid organization.

Because of my connection with my work at the head of the Agricultural Extension Department of the Louisiana State University and my past work with country boys and girls in the capacity of teacher and superintendent, it gives me great pleasure to have this opportunity of expressing to you my ideas of the kind of education that

will aid in solving the South's rural problems.

I wish to say in the beginning that I am a Southerner, born and raised in the State of Louisiana. My father was a Confederate soldier, wounded in the battle of Shiloh, and has not walked a step since that great battle without the aid of crutches. My mother is a daughter of a Confederate soldier. I married a girl whose ancestors for many generations were Southerners. My people probably suffered as much from the ravages and calamities of this war between the States as those of any man and woman in this audience. The slaves owned by my ancestors were all freed. I am telling you these things because I am going to say some things about the peculiar social conditions of the South, some things which I think I have a right to say, because of my Southern origin and Southern experiences.

My subject is "The Kind of Education That Will Help Solve Rural Problems." This can only be done by making rural education more efficient. The word "efficient" is a very big word. It is a word that is being talked of more today than any other word in the English language, and when its meaning is applied to rural education and rural life many of our country problems will be solved. This word is used in our pulpits on every Sabbath; it is in almost every editorial and advertisement written.

When thinking men meet and mingle you will hear this word used over and over again. Aristotle and Plato separated over the relative value of poetry and philosophy. Poetry and philosophy have not been discarded from our lives; they hold comparatively insignificant places.

The big man now is the efficient man. The question is not what do you know, but what can you do.

Once all honors went to the destroyers and exploiters. The man who could kill was the king by divine right, but now honors go to efficiency. The efficient man is the creator and builder. To be efficient not only must you make a living for yourself, but out of the surplus of your energy you must be able to do for others. This great world of ours is being made over, and man's business is to work with nature, to utilize nature's forces and combine them in forms of utility and beauty. The world has always been blessed with philosophers, who talked and thought about things. We have always had poets who gave us graceful and gracious and beautiful expressions of life, but we have found in the present day that it is not enough to be graceful, gracious and beautiful, but we must be useful. This is the kernel of the new American philosophy, and must be applied to our education.

I wish to confine my discussion largely to the South's rural educational problems. I want to say something of our unique social life in the South which was created on account of slavery. These conditions have been handed down to our present-day generation, therefore excusing us in a way for our shortcomings in agricultural development in the South.

Under the antebellum regime many of us had slaves to do our work. The negro was the man to draw the water, hew the wood and till the soil. Naturally these things relieved us of much drudgery that the man who did not have slaves was compelled to do. This condition created what is known in the South as the "slave holder" and "poor white trash." When the slaves were freed the wealth of the South was taken from us, leaving only an inheritance from the antebellum system, which has given all of us the wrong attitude toward labor; besides this distorted notion of labor, thousands of illiterate negroes with which to contend.

I believe that this attitude has possibly done more harm and has retarded agricultural development in the South more than any other one thing. We have not yet decided that it is entirely honorable to labor with the hands. We say that the man who works with his hands should stand as well in society as the man who lives by his

brain. But do you know that way down in our makeup we do not believe it? We Southern people do not believe it. We are not living it, and in all of our social institutions show our real belief.

This inherited attitude of ours has cost us more than the loss of our slaves. This inherited attitude of ours has created among our people thousands and thousands of men and women who are not breadwinners, but simply parasites. Our schools in the past and even in the present are organized and manipulated for the purpose of furnishing recruits for the professions. I am glad to say, however, that this sentiment is changing rapidly and the course of study is being made more practical so that it will come more nearly fitting into the life of the people. I am sorry to say that it is coming just a little late to save for us in the South the wealth to which we are justly entitled. I have made some investigation in my own State and find that our native born Southerners do not own the bulk of the property. On the other hand, you will find that in many instances the property is owned largely by nonresident people and people who have come into our State from other States. I have examined the tax rolls of a number of parishes in my own State and find that newcomers and nonresident people own, in some instance, as much as 90 per cent of all the taxable property. This transferred wealth from our own kith and kin has taken place in most instances within the last twenty years. This I think is indeed an alarming situation and shows that something is radically wrong with the South's economic condition.

I do not wish to be misunderstood. I most cordially welcome all good citizens into the sunny South, but I do want our own people at least to have some stock in this splendid country of ours. I want our boys and girls so educated that when they become men and women they will have been trained concerning our resources; that they will not flit their opportunities away as we have done and they will not continue to sleep idly on the South's field of hidden treasures. This change of attitude must be brought about in the minds of our boys and girls in our public schools. We should ever keep before them that by intelligent, honest, well-directed labor rural life can be made both profitable and pleasant. Gentlemen, you are the men to help change this attitude of our Southern people. You should demand that your schools prepare properly the minds of your boys and girls. Insist that your schools lead your children along the lines that are conducive to better rural life.

My observation and experience has taught me that our Southern



Part of East Tennessee Corn Club, Organized at East Tennessee Farmer's Convention and Institute.

boys and girls do not mind work; it is not a question of what they can do, but a question of this inherited or handed down attitude. To illustrate, there is a certain town in Louisiana where there are about thirty grown men. I pass there frequently, and nine times out of ten at the railroad depot I have found twenty to thirty men, stout, stalwart, youthful fellows sitting there, never doing a bit of work. These young men are not afraid of work. They will play baseball the hottest day in the year. They are graduates of the high school in the community and are physically able in every sense of the word to make a living; but in that community there live a large number of men who once owned slaves, or whose parents owned slaves, and the feeling is that it is not just right for these boys to work with their hands, because their grandfathers were wealthy slave owners, and, of course, have much "blue blood in their veins." It would not look well for them to get out and labor. That feeling and attitude is the inheritance.

Our trouble is organic. This attitude is inborn. Our public schools must right about face. The 95 per cent of the boys and girls who never enter professions must not be forgotten. Our schools must no longer be preparatory institutions for colleges and universities, nor recruiting stations for the professions, but, on the other hand, must fit them for the lives they are to live.

I have been in the school work all my life. I have great respect for the public school's phenomenal achievement. I believe that when our course of study is based on "Education for Efficiency" our distorted social and economic conditions will be righted. It is right along this line that criticism comes in regard to our public schools.

Now the boy is taught when he enters school, by teacher, mother and father, that he must go to school and get an education in order to get away from the South, to get away from the farm. They say to him, not in words, but in action, "Go to school so many months and you will be able to sell soda water in a drug store or sell calico across the counter; you must go to school and make something of yourself."

Our boys and girls have not been told that right next to them just outside the school door lies a great undeveloped country and that with the proper knowledge of its great resources they could go out and become rich, or at least make useful citizens of themselves.

They did not tell me when I was going to school that they wanted me to get away from home, but every lesson, every suggestion, tended that way. The teacher told me about great men and in every case they said he went from the farm up; the text-books also told of great men and in each case he went from the farm up, and never from any

station in life up to the farm. They did not tell me that in the forest surrounding were contained millions of dollars worth of timber. They did not tell me that in a few short years this forest would be manufactured into lumber and that Louisiana would be the leading State in the lumber production. They did not tell me the soil was wonderfully rich; that it would give three or four crops a year, and under sunny Southern skies was the best place to live. I was not taught anything of this in school. Neither was I taught anything of the value of fine stock; how to distinguish between dairy and beef types of cattle; how to raise an acre of corn; how to judge the values of things that I daily came in contact with.

We must change our attitude. Our boys and girls in the South must be taught practical values. I believe in a school system that teaches our boys and girls that our national government is the greatest of all governments; that our Southland is the best of all countries; that just outside the school building lie untold riches, which, with foresight and industry, can be brought into use, and that to remain here and become intelligent, frugal citizens is wise and intelligent.

My father and mother said when they sent me to school that they wanted me to "make something" of myself. What was that something? "That something" was the school's ideal. To reach this goal, this social ideal, the schools insisted that we study everything that was not directed toward skilled and intelligent labor. To make "something" was to study abstraction and get away from those things that we were accustomed to on the farm. Let us notice some of the results. Fifteen or sixteen years ago there came to Louisiana a well-dressed business man who said to Mr. Jones, a small farmer, who had several hundred acres of timber, "You have some old trees here which look pretty fair; I will give you a dollar an acre for them if you do not say anything about it." Mr. Jones, who had never been taught the value of timber, said to the intelligent, value-seeing stranger, "You don't mean that you will give me a dollar an acre for the timber which I have been praying would be blown off?" "I mean it," said the man trained in values, and on the next day they went to the parish seat and had the deed made. This and similar instances happen all over the timber belt of our great State. I ask again, what has been the result? The timber now does not belong to the citizens of the country, but to the people who have come from abroad and non-resident. I say again we are not teaching the proper things in our schools. If Mr. Jones, and the thousands of other Southern men, had been taught properly they would not have sold these great forests for almost a song.

But you will say I need not talk about this now, that the forests are all gone. Our rich lands are going just as fast and just the same way.

Our country is now being settled very rapidly by large numbers of persons who are tired of the cold, severe climate of the North. They are coming to live beneath our sunny skies—coming South. We, as Southern people, ought to be able to trade with these new comers intelligently; we ought to know the relative value of land, timber and live stock. Many of our farmers know how to grow cane, cotton, corn and many other things, but they do not know how to market it. They do not understand the law of cooperation. Our schools should give them a cooperative training and commercial knowledge that would enable them to dispose of what they have for the very best price. I would not destroy or take from the course of study everything that has been taught in former years, but I would place in it those things which keep the value of our resources. It is not a question whether we ought to do it, but we must do it in self-defense. If our boys and girls are not educated more efficiently they must necessarily become laborers for the men who have had this training and are coming into this country. I wish to state again that I am glad to see them come; we welcome them to our country; we need them; but our own boys and girls should become shareholders in this great development of our land.

Long years ago when the South first organized its first universities they were built and maintained for the select few. In these great universities were employed professors with a wonderful knowledge of the subject they were to teach. I wish to say for them that they worked in the spirit of the scientist and made some wonderful discoveries. They were recorded in a great book, filed away in the laboratory or library of the university. Who received the benefits of these discoveries? No one, except the professor who came after and a few fortunate young men who were able to afford the high education. The universities have had thousands of students, but these represent but a very small portion of the thousands of bright boys and girls who never had an opportunity of darkening their doors. This state of affairs has gone on and on and the universities have not reached the great mass of the people. The modern universities change this: They have extension departments to carry those things which are being worked out by their different departments into the home, into the field, into the schools all over the State. Instead of a few thousands in the universities as has been the custom for years, we

shall have in the near future every man, woman and child of the whole State enrolled among the student boys and receiving benefits therefrom. The boundary line of the "campus" will be the State line.

Valuable locked up information is no longer to be enjoyed by a few, but is being sent to the people all over this great land by extension department and United States demonstration agents.

Take the work of the Boys' Corn Clubs of my own State as an example of what may be accomplished. Through the influence of these clubs and the farm demonstration work among the farmers the yield of corn in Louisiana has been increased from eighteen million to fifty million bushels during the last decade. An excellent showing has been made by our boys' and girls' hog club and tomato clubs. One boy made in premiums and increase on one hog in one year two hundred and eighty-seven dollars; through the influence of the girls' canning club work thousands of preserved vegetables have been added to the farmers' winter food supply. I feel that the work among the girls has been especially beneficial in removing a feeling in our Southland that girls ought not to be made to work. As you know, we teach some of our girls that they must not work, but keep their hands soft for piano playing.

It is almost impossible for those of us who have passed thirty to change our old ideas, but our children can be given a different standard. I believe our public schools should have on one side of the school building the class in home economics and domestic science, which should have for its teacher one of the most beautiful and talented young ladies in the whole country; and on the other side of this school building should be a gifted lady teaching music, as beautiful if you will; and I believe the daughter of the banker, the daughter of the doctor and the daughter of the farmer and the daughter of the blacksmith should go for lessons in domestic science and home economics, the art of home-making, thence to the class in music. Such a condition would at once place labor on a high plane and eradicate from the mind of these girls the traditional attitude. I would have a school of agriculture for the boys, in charge of one of the best and strongest teachers of the faculty. I would have sons of lawyers and farmers work in the field under the direction of this agricultural expert, as well as sit together in the class room for the classics.

I want to give you an example of one thing that happened in the northern part of Louisiana. There is an old community situated about eight miles out from the railroad, which had produced, before the war, many great and cultured men and women. Since that time, however, the community has gone down, the paint has faded from the houses,

the lawns were unkept, the signs of affluence were gone. They were simply living on things that had passed. Their talk was of things "before the war." They often spoke of great deeds they had accomplished. Two years ago an agricultural school was started in that community and at the head was an expert agriculturist, a real live wire. He organized a girls' and boys' hog club, and I was called on to witness the school exhibit. At this exhibit the boys had fifty-five registered high class Duroc Jersey, Poland China and Berkshire hogs. These people came out and witnessed this boys' hog show. They felt again that the South was being rebuilt. These boys carried their hogs to the parish fair and won every premium, and, too, they had seventy-five per cent of the hogs exhibited. The best of these were sent to the State fair and there received several premiums. This work teaches a boy or girl how to properly feed a hog in accordance with the very best method. He learns what a balanced ration means; he gets in touch with the chemist at the university. He notes the gains made each day and figures out the net profit—learns practical lessons in a systematic way. Such boys and girls as these will rebuild our Southland.

To show you something of the attitude against this work by some of the people I will relate an incident which occurred at this exhibit of fine hogs. There was one very fine specimen, weighing something like four hundred pounds. A progressive farmer was looking at it in wonder and amazement and finally turned to another farmer who was not in accord with this work and said, "I would like to get some of that stock." The non-progressive farmer shook his head and said, "Them hogs have been powerfully pampered. I don't want no sich hog."

Let us train our boys and girls to do things; let us teach them that their community is the best on earth and that right where they are lie great opportunities. Teach them those things that are most valuable so that they may become factors in the great uplift of our splendid Southland. Let us, as teachers, encourage this new education. Let us preserve our beautiful stories of our South's chivalry. But at the same time instill into the minds of the boys and girls that life is what they make it, and the vital question to them is not what you know, but what you can do.

Let us teach those valuable things that touch our lives nine-tenths of the time. A school system or college that neglects this is not worth while. These things must be done as a matter of our Southern preservation. Our economic condition today is the result of lack of training, the outcome of a mistaken ideal.

PROGRESSIVE AGRICULTURE.

ADDRESS BY W. W. FINLEY, PRESIDENT SOUTHERN RAILWAY COMPANY,
AT THE FORTIETH ANNUAL MEETING OF THE EAST TEN-
NESSEE FARMERS' CONVENTION AND INSTITUTE, KNOX-
VILLE, TENNESSEE, MAY 21, 1913.

In looking over the programme of this fortieth annual meeting of the East Tennessee Farmers' Convention and Institute which Dr. Morgan kindly sent to me, I was impressed with the wide range of discussion outlined and the practical nature of the subjects assigned to speakers.

No one could study your programme or attend this splendid convention without being convinced of the progressiveness of the farmers of East Tennessee. The programme suggested to me the topic on which I shall address you today, "Progressive Agriculture."

As we review the history of the United States in the nineteenth century we note that the American people as a whole made relatively less progress in agricultural methods than in other lines. There were great improvements in agricultural machinery and implements and great increases in the total volume of farm products, due to the great additions made to our cultivated areas by the opening up of the West. That farm management and methods showed relatively little improvement was in large measure due, in my opinion, to this increase in cultivated areas. Vast tracts of government land were given away or sold very cheaply. The farmer in the old States had little incentive to conserve his soil or adopt the methods that would increase its productiveness. When his farm was worn out he could move to the West and make a new start on soil that had never been tilled. Under these conditions the tendency was to enlarge production by increasing acreage rather than by working for larger yields per acre. Another influence tending to retard the improvement of farm methods was the relatively low level of prices which prevailed during the latter part of the century, brought about by the faster increase in production than in demand, due to the greatly enlarged area under cultivation. With wheat at fifty cents a bushel, corn at twenty-five cents a bushel, cotton at five cents a pound or less, and other farm prices in proportion, the margin of profit to the farmer was so small as not to encourage the adoption of methods that would give him larger returns per acre. In many instances farmers could ill afford to put out money for improved implements or fertilizers. At the same time, the low cost of meat production on the great Western ranges deterred

them from raising live stock and improving their lands with manure. The result was that, especially in localities where single-crop farming was the general rule, many farms were allowed to run down and there was a widespread belief that farming in the older States could not be made generally profitable.

In the last twenty years we have seen a marked change. Our cities and towns have grown with great rapidity, adding millions to the number of consumers. At the same time the demand for farm products for export has been undiminished. But the better farm lands of the West having been occupied, it was no longer possible greatly to increase production by enlarging the cultivated area, and the cutting up of the Western ranges into farms brought about an actual decrease in the meat supply. The result has been that we have had a smaller surplus for export and our own people have had to pay higher prices for all kinds of farm products, and this has been one of the factors in the high cost of living which is so generally discussed.

While good prices are beneficial to the farmer, it is not to his interest that the cost of living in cities and towns shall be unduly high, for his prosperity is dependent upon the ability of those engaged in other occupations to buy his products. An ideal condition is one in which prices are profitable to the farmer and are not unduly high for the consumer. The demand for farm products continues to grow and, if the cost of living in cities and towns is not to be unduly advanced, it must be met, in large measure, by increasing the yield of lands already under cultivation.

This condition of affairs is particularly advantageous to the farmers of the Southeastern States and there is no reason why any farmer in this section should move to the West or to any other locality. In proportion to their productive value lands in the Southeast are cheaper than in most other sections, and our farmers have a great advantage in the accessibility of markets. Throughout all of the territory east of the Mississippi River and south of the Ohio and Potomac Rivers thriving manufacturing and commercial cities and towns are growing up, giving to the Southeastern farmer the advantage of home markets. He is also within easy reach of the great cities of the Northeast with their enormous demand. He has advantages of soil and climate that are unexcelled and which enable him to grow successfully all of the crops usually produced in the Northern States as well as those that require the longer growing season of the South. He has every advantage for raising live stock of all kinds and Former Secretary Wilson stated in substance before a committee of Congress that con-

ditions for live stock raising were better in the South than in any other part of the United States.

As a class, the farmers of the Southeast have shown their ability to utilize their advantages. Agriculture throughout this entire section is progressive. This is notably true of Tennessee. The statistics of the United States Department of Agriculture show progressive increases in the average yields per acre of each crop reported on for Tennessee, and I have no doubt that this convention and institute, meeting annually for forty years, has been an important factor in bringing this about.

What has already been accomplished in this State is indicated by comparing statistics of average yields per acre in 1910 and 1911 with those for the ten years ended 1889. They show increased yields per acre of 28.5 per cent for corn; 75.8 per cent for wheat; 56.2 per cent for oats; 83.5 per cent for barley; 81.7 per cent for rye; 38.9 per cent for cotton, and 24 per cent for tobacco.

Great as has been the advance of the farmers of Tennessee, however, there are still opportunities for progress. Average crop yields are still far below the possibilities of your soils. In almost every neighborhood we will find great differences in crop yields. In some cases one farmer will regularly harvest two or even three times as much per acre as a neighboring farmer will grow on soil that was originally equally productive. The explanation is simply a difference in method, and, until the average production is brought up nearly to that of the most successful farmers, there will be room for progress. We are living in a time when great progress is being made in the improvement of method. Scientific investigation in State and Federal agricultural departments, in agricultural colleges and on experiment station farms are demonstrating new truths and working out improvements in methods. They are reducing farming to an exact science, in which the only variable factor will be the weather, and they are learning how, by cultural methods, to reduce to a minimum the effects of unfavorable weather conditions. Our agricultural colleges are each year sending out splendidly educated farmers and highly trained experts in every branch of agriculture, and each year more attention is being given to primary and intermediate instruction in agriculture in our common schools. Boys' Corn Clubs and Girls' Tomato Clubs are doing an invaluable work in giving practical training in improved cultural methods to the farmers and farmers' wives of the next generation. When we measure the possibilities of our soils by the achievements of the most successful farmers we are justified in the belief

that the total yield of farm products in the Southeast might easily be doubled. When we consider the various agencies that are working for farm improvement I believe we may expect that this will be brought about in relatively a few years.

There are opportunities in the Southeast in addition to increasing the yields of the staple field crops. The greatest obstacle to agricultural advancement in this section has been the tendency of many farmers to devote their attention exclusively to the so-called "money-crops," often to the extent of having to buy their own fruits, vegetables, meats and dairy products, and feed for their work animals. This has not been the case to such an extent in Eastern Tennessee as in the regions where cotton is the principal crop. Even in this region, however, there are localities where so little attention is given to producing supplies for local markets that many of them are shipped from other parts of the United States.

Not with any purpose of entering upon a course of unkind criticism, but recognizing fully the splendid progress that has been made by the farmers of Eastern Tennessee, I may indicate some opportunities that seem to have been, in a measure, neglected.

A report from an agent of the Southern Railway Company on conditions in a prosperous town in Eastern Tennessee says:

"The town is shipping in practically everything used in the way of vegetables that ought to be grown in their own locality. There are only two men in the vicinity who are doing any trucking."

The people of the town referred to spend several thousand dollars a year for truck. If this money could be paid to farmers in their own locality it would benefit the entire community, for it would mean that the money would be retained in the community.

In Eastern Tennessee, Southwestern Virginia and Western North Carolina there are many localities with natural pastures suited particularly for cheap beef production, and the shipping of cattle from this region to be finished for market elsewhere is an established industry. It has been reported to me, however, that, in some parts of this region, the supply of cattle is growing smaller from year to year, due to the practice of selling heifer calves for veal. It must be apparent that this practice, if persisted in for only a few years, will seriously reduce the supply of beef cattle. The management of the Southern Railway Company believes that this would be most unfortunate for this region, especially as there is every prospect that the growing demand for meats will make the raising of beef cattle in the Southeast increasingly profitable. We have, therefore, instructed

our live stock agent to urge farmers throughout the territory traversed by our lines to raise their heifer calves and to improve their herds by buying pure-bred bulls of the beef breeds.

Eastern Tennessee has produced some of the best dairy cattle in the United States and it might be expected that local producers of dairy products would supply all of the markets of this part of the State. Recent reports from the operation of our dairy car in this region, however, show that this is not the case, particularly in the mining communities. I may refer to a report from one Eastern Tennessee town as indicating opportunities not only for dairying, but also for truck growing. The report in substance said:

"Apparently this is a splendid opportunity for the location of a good man who desires to start a small dairy. It is said there are less than twenty-five cows in the vicinity to supply dairy products to 5,000 people; that only two men, with eleven cows, even pretend to sell milk. The inhabitants are largely miners—good spenders—demanding many truck products, all of which are shipped in. Land is not very high. The opportunity looks good for this line of farming. The scarcity of milk is evidenced by condensed milk at the hotel today for dinner."

From another town the agent reported: "So far as I can learn no one is in the dairy business in this section. Good butter cannot be secured."

At another town: "The locality is ideal for dairying, but the people have not yet waked up to a realization of their opportunities."

The trip of our dairy car served to bring the advantages of dairy farming to the attention of many of the farmers of this region and it is our purpose to have an assistant dairy and poultry agent follow it up and give practical advice, to all who may desire it, in herd selection and management, handling milk and cream and making butter. We hope that the time is not far distant when every community in this region may draw its dairy supplies from local dairymen and when, instead of buying such products from other localities, Eastern Tennessee will ship large quantities of dairy products to markets outside of the State.

One of the hardest problems confronting the farmer is that of successful marketing. This is especially true when he undertakes the growing of some perishable product without full knowledge as to how it may best be marketed. It has happened, at times, that such products have spoiled in the hands of farmers who did not know how or where to market them. An instance of this was reported last fall by a field

agent of our Department of Farm Improvement Work who wrote that at a point in Eastern Tennessee many barrels of apples, the finest form and size that he had ever seen, were rotting. An inquiry as to why this condition existed developed a general lack of market information on the part of the growers. About the same time we had reports from other localities of farmers seeking markets for various kinds of truck, cane syrup, and other products. As a result of this condition the Southern Railway Company and the companies associated with it appointed four market agents to advise producers as to markets and as to methods of packing and shipping. Although these agents have been in service but a few months they have been instrumental in aiding producers to find markets for such things as hay, sweet potatoes, tomatoes canned by Girls' Tomato Clubs, and a variety of fresh fruits and vegetables.

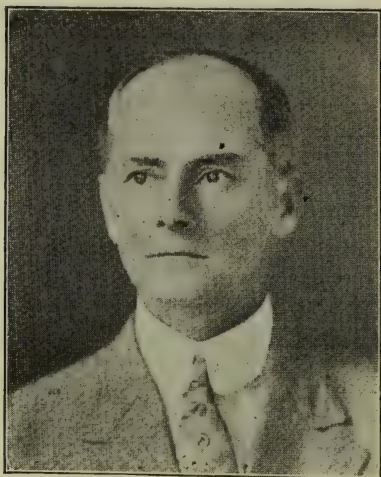
The opportunities indicated by the reports from which I have quoted will grow in importance with the continued development of local markets and the increasing demand of the Northeastern cities for fruits, vegetables, dairy products and meats, and I believe that the farmers of this region may well give increased attention to these branches of farming.

I have not attempted to give specific advice as to farm methods or management. I desire, in conclusion, however, to emphasize the importance of soil improvement. Experiments in our own country and those in Europe carried on over long periods and the records of European estates, in some cases running back for centuries, show that properly managed soils never wear out, but that productivity may be developed and maintained indefinitely. Scientific crop rotation, winter cover crops, live stock raising, the intelligent use of commercial fertilizers and of lime on soils that will be benefited by it, are the essentials of soil building. In Eastern Tennessee you have most favorable natural conditions, you have an intelligent and progressive agricultural population, and we may confidently predict that each recurring meeting of the East Tennessee Farmers' Convention and Institute will witness a further advance in progressive farming and the attainment of a higher level of prosperity throughout this region.

The cheapest way of getting started in the business of breeding fine poultry is to buy eggs and hatch them. Ten or a dozen chicks are often produced from a setting of eggs, which may be purchased for less than the cost of a single first-class fowl, and any one of the chicks is worth more than the total outlay.

THE BUSINESS FARMER.

CLARENDON DAVIS, HUNTSVILLE, ALA., BEFORE EAST TENNESSEE
FARMERS' CONVENTION AND INSTITUTE.



pleasures and some of the luxuries of this life.

Good roads and the telephone and the rural mail have put the farmer in touch with the outside world and those who are ambitious to rise above the common level have become thinkers and students and are rapidly making themselves recognized as business men.

The gap separating the wide awake business farmer from the slipshod, fertility-destroying individual who plants in the moon and depends upon nature for the profit, is broadening every day. The business farmer is advancing with the rest of the world, while his unfortunate neighbor, who farms as did his ancestors, is drifting down the stream of adversity.

To be a business farmer does not necessarily mean the possession of broad acres and unlimited capital, but it does mean that he is a builder, a constructor, one who is not planting and reaping without one thought of tomorrow, but one who farms with a view of increased fertility; one who builds up his acres in order to increase the value of his possessions and the value of his citizenship.

Too many farmers aim to buy more land and thus spread their limited means over greater acreage when they have failed to show their ability to manage what they already possess. There is not one farmer in the South that is getting all out of his land that it is able to produce. When one shows his ability to manage that which he

As the farmer prospers, so will every other line of business prosper. He is a wealth producer and upon his shoulders rests the financial prosperity of the State. If he fails, the State fails. Then it becomes the duty of every citizen, every commercial enterprise, to encourage and assist him in his efforts for better credits, better farms, better stock, better buildings, roads, school houses and churches, that he and his family may enjoy better social conditions and enjoy the

now owns it is no trouble to secure more land or to secure the means to spread out.

The common conception of the business side of the farmer is to sow, reap, haul the products to town, sell them for what they bring, pay your debt and go back home to start all over again. The farmer of today must be a business man, contrary to common conception of what it takes to be a farmer.

The success of a business is measured by results. The success of a farmer is not measured by his efforts but by the results of his efforts. Results are what count. The crop result of an acre determines the value of the soil. If by business methods in cultivation and business methods in placing the products on the market we are enabled to double the income from our land we more than double the value of our lands.

To increase the productiveness of the land requires careful thought and study. One hour of rest plus one hour of thoughtful consideration of a definite plan is equal to four hours of scattering manure or sixteen hours between the handles of a bull tongue plow. The productiveness of our land measured by the cost of production determines the degree of success of farming as a business venture. Productiveness of the soil is not determined by the muscular effort expended in its tillage even though supplemented with commercial fertilizers. Many farmers have confused commercial fertilizers with brain. He has tried to substitute commercial fertilizers for brains. He has tried to substitute the offal and carcass of the ox and the remains of prehistoric animals for the gray matter lying dormant in his head. There is more plant food in one ounce of brain than in a carload of commercial fertilizers when it comes to a permanent growth of productiveness.

Commercial fertilizers are a Godsend when properly used and a curse when used to stimulate the land for present needs. Stimulation today lessens the productiveness of tomorrow. We cannot lessen the cost of production if we lessen productiveness.

The greatest problem confronting the Southern farmer is that of productiveness. The greatest business opportunity in all this country lies under our feet. It is the restoration of our unproductive lands.

The business opportunity of the South is the restoration of the unproductive soils. It is more profitable to build unproductive soils that were once good than it is to farm the average productive ones. It provokes me to hear a stranger, let alone one of our citizens, speak of the wornout lands of the South. There is no wornout land in the

South; if it was once good it is still good. It may be unproductive, made so by unbusinesslike methods. We have sapped its life. We have changed its mechanical condition and now it is a dead soil, but one that can easily be brought back to a high state of productiveness.

It is a common failing of us to neglect the opportunities at our feet because they have become commonplace by long association. We long for the flesh pots of the North or seek the golden opportunities of the West, and are led away by a mirage of plenty, to lands where adverse conditions excite our inert energy to conquer, and we build prosperous towns, cities and communities by the brain and muscle that justly belong to the land of our birth.

I used to think there were some of our lands that Providence made in order to keep from being a hole in the ground, or just to hold better portions together. I now believe all lands, of whatever character, are intended to be utilized for some good purpose.

In the northwest corner of my home county is a strip of land known as the barrens that a few years ago was considered worthless as farm land and could have been bought for \$2.50 per acre. It is an extension of the Highland Rim of Tennessee. As the farm demonstrator of my county, I secured the cooperation of an old Confederate soldier, sixty-five years of age, to farm twenty acres of his land by the improved methods as outlined by the Department of Agriculture with the results that have astonished the whole country. This old gentleman has proved that the Highland Rim soil is as good as the rest of the world. He raised oats to the value of \$75.00; hay, \$150.00; corn, average forty-five bushels to the acre, \$276.25; peas grown between the corn rows, \$35.00; four and a half bales of cotton at \$12.65, \$284.60; two and a fourth tons of cotton seed at \$16.00 a ton, \$36.00. The total was \$850.00; after deducting the cost of labor and fertilizer of \$125.00, we have a net profit of \$725.00, or \$36.25 net per acre. In this case it was not the land, it was the man. It was an illustration where brains were used. It's an example for the rest of the farmers of the South. What one man can do all can do if the use of the same care and judgment are employed.

The average income over and above cost of taxes, insurance, labor and general farm expense of the six and one-half million farms of this country is \$70,000, or less than \$2.00 a day. Just think of it—\$2.00; is this enough for the average farmer; is this enough for him to meet his church dues, buy his clothing, his carriage or automobile? The mechanic makes more than this and no capital invested other than his brains. Two dollars a day profit is not enough for the average

farmer, and to increase this we must increase productiveness and lessen cost of production and use more businesslike methods in marketing the crops.

It is a simple matter to increase the producing capacity of our soil, if we will but conform to a few simple rules laid down by nature. Take, for instance, one of the old unproductive fields of our farm. If we would let it alone nature would restore it, but with our assistance she will do in five years what it would take her twenty years to do alone.

The first essential is to add humus to the soil by turning under some vegetable matter, it matters not what. Plant anything that will give the greatest growth and stimulate to the rankest growth by the use of commercial fertilizers and when it has reached its full maturity turn it under. Then if the soil is deficient in lime, which is the case with the majority of the soils of the South, add the ground rock and harrow it in. Few realize the great value of the sorghum plant as a source of humus; this plant will make more growth on thin soil than any I have ever tried. It is said to be very exhausting to the soil and it is, if we remove the crop, but in our soil building we must return all of the growth from our first crops. If the growth is turned under in the fall and rye sown to be turned under in the late spring we will be in shape to sow the land in clover or peas. Land so treated and sown to clover or peas with liberal applications of phosphates and potash will almost insure a good crop if the rainfall is sufficient.

When you can grow heavy crops of clover and peas even with liberal use of commercial fertilizers the soil will increase in fertility if we keep in mind that we must add humus.

It is said that \$250,000,000.00 is burnt up every year on the farms of this country. That means \$41.00 of vegetable matter is burnt up every year on an average to every farm. A soil builder will never burn up grass, stubble or even weeds. He knows too well the humus-forming value of these.

Humus first, then lime, then nitrogen, is the keynote. Humus is placed first because it is the "soul of the soil." Without it we can never become soil builders. It makes the soil porous; retentive of heat and moisture and tends by chemical action to liberate the mineral plant foods. In short, it makes a dead soil a live soil.

You can't make money on poor land. Then build it up by persistently feeding it with vegetable matter, be it by plowing it under or feeding the products to stock and returning the manure. The more you return to the soil the more it will give back to you with a big percentage of profit of its use.

SOME COMMON DISEASES OF SWINE, SHEEP AND CATTLE AND HOW TO CONTROL THEM.

GEO. R. WHITE, M.D., D.V.S., STATE VETERINARIAN, BEFORE EAST TENNESSEE FARMERS' CONVENTION AND INSTITUTE.



It affords me pleasure to appear before you this morning to discuss as best I can the subject assigned me, "Some Common Diseases of Swine, Sheep and Cattle, and How to Control Them."

To begin with, we should know the number and value in dollars and cents of each of these three species of animals in Tennessee before we can begin to realize the importance of protecting them from the ravages of disease. It will also be necessary to approximate the loss which occurs annually from diseases of all kinds.

The last Federal Census (1910) places the number and value of swine, sheep and cattle in Tennessee as follows:

	<i>Number.</i>	<i>Value.</i>
Swine	1,386,050	\$ 7,320,377
Sheep	793,963	3,005,538
Cattle	994,941	20,654,743
<hr/>		<hr/>
Total		\$30,980,658

The estimated annual losses from diseases of all kinds and classes is \$8,000,000, a large proportion of which could be saved if the owners could be induced to realize the necessity for the enforcement of rigid rules and regulations governing live stock sanitary control work in Tennessee and to properly appreciate the importance of farm sanitation.

HOG CHOLERA.

The one disease above all others which should most concern you farmers of East Tennessee and, as for that matter, every farmer in the State, is hog cholera. Hog cholera is a highly contagious disease of swine which is similar in many respects to typhoid fever in man. It causes ulceration of the intestines; typhoid fever produces similar in-

testinal ulceration. In hog cholera we usually observe haemorrhagic spots on the kidney; the same lesion of the kidney is observed in typhoid fever. Hog cholera also produces a reddish discoloration of the skin. So does typhoid fever produce similar skin discoloration. Of all the animal diseases now prevalent in Tennessee, hog cholera causes by far the greatest financial losses. It is prevalent at almost all seasons of the year in most every county in the State.

The losses in Tennessee during the past year from hog cholera have been unusually heavy. Conservative estimates have placed the losses from this one disease during the past year in this State at from two to three million dollars. Any disease which causes a loss of from two to three million dollars in a single year in a State as small in size as Tennessee certainly deserves more than passing consideration of the farmers, swine breeders and lawmakers; hence I believe I am warranted on this occasion in directing your attention to this disease and its dangers to the swine industry. Its control and suppression is a problem.

The present General Assembly has placed at the disposal of the Agricultural Department the sum of \$10,000.00 for the purpose of establishing and equipping a plant for the purpose of manufacturing and distributing anti-hog cholera serum to the swine raisers of Tennessee at actual cost of production; however, this appropriation is included in the general appropriation bill, the legality of which has been questioned, hence the appropriation for this purpose is not yet available. It is to be hoped that this appropriation will be forthcoming at an early date, in which event a million dollars worth of hogs can be saved the first year. The free use of anti-hog-cholera serum is the method by which we hope to stamp out hog cholera. The Dorsett-Niles Anti-Hog-Cholera Serum will certainly protect hogs against cholera, provided it has been properly prepared and scientifically administered. However, it requires some instruction before anyone is qualified sufficiently to handle this serum as it should be handled. We have found a great array of impotent serum on the market. Of course, such serum will not begin to protect hogs against cholera.

With the advent of Dorsett-Niles Anti-Hog-Cholera Serum about three years ago the most deadly of all swine diseases was doomed to ultimate eradication from the American continent. It is a well-known and fully-established fact that until then the swine owners' investment in hogs was at all times jeopardized by this disastrous disease.

Long ago all well-informed individuals fully realized that every

medicinal treatment for hog cholera which had ever been proposed was worse than worthless in curing this disease. The swine owners' pocketbooks were continually being depleted and flattened by so-called "hog cholera cures" of all kinds and descriptions, which in reality were nothing more or less than "fakes" and "frauds" compounded for the purpose of wrenching hard-earned dollars from the honest, though gullible, hog owners.

The press—the agricultural press in particular—carried in each and all issues glaring advertisements of numerous so-called "cures for cholera." In spite of the large amount of money spent for these "fake remedies," hog cholera continued to spread with cyclone rapidity. Since the discovery of the Dorsett-Niles Anti-Hog-Cholera Serum and its demonstrated and undisputed efficiency the "fakes" have shifted their advertisements from "medicines" to so-called impotent fake "serums" and "vaccines," for which it behooves the farmers of Tennessee to be on the constant lookout.

The Dorsett-Niles serum when properly made by reliable and well-trained men, according to the United States Government standards and by other definitely defined technique of Drs. Dorsett and Niles, when properly administered, will undoubtedly protect healthy hogs from cholera. However, the field for fraud and deception is so inviting that the unscrupulous fakirs have already invaded it with their worthless "juice" in the form of vaccine or serum. Look out for them and refuse to allow them to separate you from your hard-earned dollars.

Before purchasing hog cholera serum from anyone take the precaution of determining whether or not the manufacturer is in possession of a permit from the State Agricultural Department for its sale in Tennessee. Up to May 1, 1913, only three commercial firms have been granted permits to market anti-hog-cholera serum in Tennessee. The names of these firms will be furnished upon application to the State Veterinarian.

At the present time this State is being flooded with advertisements—by mail and otherwise—of at least thirty commercial firms who have something attractive, in price or otherwise, to offer the swine owners for the treatment and prevention of hog cholera. Beware of these and remember that all medicines advertised as "hog cholera cures" are worthless and that 50 per cent of the "serums" and "vaccines" are frauds and are sold and distributed in this State in open violation of the law.

Remember a few ways by which hog cholera is spread and there

is no occasion for you having an outbreak of this disease among your hogs even in the absence of the use of anti-hog-cholera serum.

METHODS BY WHICH HOG CHOLERA SPREADS.

1. Running streams, such as rivers, creeks and branches spread cholera by washing the infection downstream from hog cholera outbreaks above, hence it is unsafe to endeavor to raise hogs where they have access to running water.

2. Public roads are disseminators of hog cholera. Hogs affected with cholera are liable at any time to be passing and repassing on these public highways, hence it is unsafe to allow hogs access to public roads.

3. Public stock yards. Every public stock yard in Tennessee and every other State is permanently infected with the virus of hog cholera, hence no man should even think of removing hogs from a public stock yard for breeding or feeding purposes. Whenever a hog goes into one of these public stock yards the only safe place for him is direct to the abattoir for immediate slaughter.

4. The turkey buzzard. Aside from public stock yards, I consider the turkey buzzard directly responsible for most of the outbreaks of hog cholera in Tennessee. If you draw the carcass of a horse or cow or that of any other animal which has died of pneumonia, colic or any other disease out on the farm and allow this carcass to be consumed by buzzards, the same buzzards which flock there in droves to devour this carcass may have come directly from a hog cholera carcass fifty or even one hundred miles away, bringing the infection to your farm and starting an outbreak of cholera among your own hogs. This emphasizes the importance of burning or burying all dead animals on your farm.

APTHOUS STOMATITIS.

Apthous stomatitis, or sore mouth and feet of cattle, is causing much concern to the cattle raisers of the Southern States in general and of Tennessee in particular. Its ravages have been particularly prevalent and widespread during the past season. The direct losses by death have by no means been great. The indirect losses on account of loss of milk and flesh have amounted to thousands of dollars.

The symptoms are similar in almost all material respects to those of "European Foot and Mouth Disease." Even an expert cannot distinguish between the two diseases by the symptoms presented or by physical examination. I diagnosed the disease by watching its development and spread in the individual dairy herds where it appeared. I

observed that the cases developed slowly, only a few cows in a herd becoming diseased. Hogs and sheep did not contract it, which convinced me that we had apthous stomatitis, and not "European Foot and Mouth Disease" to contend with.

Cause.—The disease is not contagious. It does not spread from animal to animal by contact. The causative agent is a fungus or form of mould which grows, at certain seasons of the year and under certain atmospheric conditions, on grasses and forage crops.

Symptoms.—The animals lose their appetite and gradually fall off in flesh. They slobber and champ their jaws. An examination of the mouth will reveal small sores on the mucous membrane of the cheeks and gums. Oftentimes the tongue becomes involved. Of course, as the disease advances the appetite is entirely lost on account of an inability to masticate and swallow the food. This results in great emaciation and starry coat. The feet become sore, with swelling around coronets (top of hoof). When standing the animals arch their backs and assume the position of a foundered horse by tucking all the feet under the body. They lie down most of the time.

Treatment.—Feed sloppy or liquid food. Wash the mouth morning and night with permanganate potash, one part to 4,000 parts of water, after which put level tablespoonful powdered alum well back on the tongue. Keep a bucketful of cold water, to which has been added one dr. chlorate potash to the gallon, within easy reach of the animal. If the coronets become involved, it is advisable to stand the animal in cold water for two hours daily. After soaking, apply ung. ichthyol and carbolic acid compound (P. D. & Co.) around top of hoofs. A change of feed and pasture is always advisable.

BLACK LEG.

Black leg is an acute infectious disease caused by a specific germ. The disease does not spread from animal to animal by simple contact, but the infection takes places from a common cause or source and this common source is the black leg infected soil. Like tetanus and many other diseases, black leg follows wound infection. This means that before black leg germs can enter the animal's body the skin must first be abraded or broken by a wound. The germs cannot penetrate the healthy normal skin. Black leg attacks sheep and goats as well as cattle. It is a disease of young cattle; rarely ever attacks any cattle over two and one-half years old. Thin skin breeds are more susceptible than those endowed with thick skin.

Black leg has been quite prevalent in each of the grand divisions

of Tennessee during the past year. The money lost from black leg during the past year has been considerably less than that of former years. This is accounted for, in part, by our more intelligent and progressive farmers protecting their herds by promptly using vaccine whenever an outbreak of black leg took place in their neighborhood. Our cattle owners have become well educated to the importance of prompt vaccination whenever black leg makes its appearance. They have found that money spent for vaccine is a good investment. Black leg usually breaks out in the neighborhood about the same time or season each year.

Symptoms.—A characteristic swelling which is at first small and painful usually makes its appearance on one or more legs. However, this swelling may appear on any part of the body except the tail and below the knee and hock joints. These local swellings usually spread, enlarge rapidly and many in a few hours become enormous in size, at which time they become soft on account of the fermentation or gas formation within the swelling, and they crackle on pressure. If this swelling is lanced a darkish red frothy fluid flows from the wound. The odor is agreeable. At first the temperature rises to 105 F. to 107 F., but usually falls to normal or even sub-normal before death. There is pronounced depression, loss of appetite, pulse 120 to 140 per minute. The swelling is usually followed by stiffness and lameness. When the skin is removed from this calf there is observed a blackish discoloration under the skin over the site of the swelling. This discoloration accounts for the name black leg. The swelling contains many gas bubbles and excludes a serous bloody fluid. The duration of this disease is one to five days and the losses average about 95 per cent of affected animals.

Treatment.—Medicinal treatment is worthless. Whenever the disease has already attacked an animal no form of treatment should be attempted. The affected animal should be killed and the carcass burned. The swelling should not be opened and the discharges allowed to infect the soil.

Prevention.—It is advisable, whenever this disease breaks out on a farm, to remove the well animals from the infected pastures. If possible, place them in a small lot. Buzzards should not be allowed to feed on the carcasses and it is preferable that the skin be left on the carcass. The ground where the animal lay at the time of death should be disinfected by placing straw or hay six or eight inches over it and burning it off. Heat is the best disinfectant, as the spores of black leg are very resistant to most chemical disinfectants. The

carcass should be cremated. Pastures upon which this disease has developed should be cultivated for several years in succession before they are again safe ranges for young cattle. Prevention is very successfully secured by vaccination. All cattle under two and one-half years old in black leg infested districts should be vaccinated once every twelve months for at least three years in succession. With the modern black leg vaccine which is put up in pill or pellet form about the size of an ordinary bird shot and an instrument made for the purpose of inserting this pellet under the skin any boy of ten years or an ordinary farm laborer can successfully immunize all the cattle on the farm from this disease. The vaccine pellets are marketed in bottles of ten doses each. The cost is fifteen cents per dose. The injectors can be bought for \$1.00 each.

ACTINOMYCOSIS ("LUMP JAW").

Actinomycosis, or the disease more widely known as "lump jaw," is an infectious disease caused by the Ray Fungus which grows on rye and barley straw, also on other grain and grasses.

In most instances the lesion or swelling appears on the jaw; however, it is not uncommon to see the disease develop on other parts of the body. Especially is it frequently observed in the lungs, intestines and udder. The udder form of actinomycosis is particularly dangerous to the human being, as the living fungi are to be found in the milk from such diseased udders.

Actinomycosis is transmitted indirectly from animal to man through the medium of the meat and milk, also through abrasions of the skin. When it appears in man it is usually in the intestinal form.

Cause.—The ray fungus from grasses gains entrance into the system by some wound or abrasion of the mucous membrane of the mouth.

Symptoms.—At first the soft tissues alone are involved and later the bone. The swellings vary in size from that of an egg to as large as a man's head. The bone becomes honeycombed and softened. Pus forms within the bone. The abscesses break either on the inside of the mouth or under the jaw. The swelling usually reduces some in size as soon as it begins to discharge pus. The teeth oftentimes become loose and fall out. The animal loses flesh rapidly on account of painful mastication.

Treatment.—There is no doubt but that nineteen out of every twenty cases of actinomycosis are curable by prompt surgical and medical treatment. The animal should be cast and tied, after which

open up the swelling. This can in most instances be done by means of a sharp knife, since the bone is softened and porous from the effects of the disease. If the swelling cannot be opened with a knife, it can be done with a chisel. After opening up, all necrosed or rotten bone should be removed, as well as dead tissue. The above can be done by thorough scraping. After which swab out with tincture of iodine. After the above surgical treatment is completed, the animal should be given four drams of iodide of potash once daily for twenty days. Iodide of potash is a specific treatment for "lump jaw."

SORGHUM POISON.

Sorghum at a certain stage of its development contains prussic acid, which is a deadly poison to cattle, and numerous deaths of cattle from such a cause are reported every summer and fall. The only way to avoid losses from sorghum is to not allow the cattle access to it. There is a popular idea afloat to the effect that it is the second crop of sorghum alone that will kill cattle. Such an idea is erroneous, as the first crop will kill as promptly as the second crop, but since the first crop is rarely ever pastured the cattle most often become poisoned from the second crop.

PHYTOLACCA POISON.

Phytolacca poison is by no means an unusual cause of death of animals, particularly cattle, in the Southern States. While phytolacca is the botanical name of the plant which is responsible for this form of plant poison, "poke plant" is the generally accepted term by which it is known throughout the section. This plant begins to grow extremely early in the season. It is one of the first green foods which greets the "grass-hungry" cattle in the spring, hence they are calculated to partake of it gluttonously, resulting in fatal poisoning in the majority of cases. It grows in uncultivated places, such as fence rows, thickets, newly cleared woodland, etc. It is a severe intestinal irritant, and the deaths occur from inflammation of the bowels, enteric.

Symptoms.—Loss of appetite, dry muzzle, elevation of temperature, diarrhoea accompanied by passage of blood and mucus from the bowels. The affected animals lose flesh rapidly. After six to ten days most of the affected animals die from weakness and exhaustion. Some die from autointoxication.

Treatment.—Remove the animal from phytolacca infested pastures; give tablespoonful of turpentine shaken well in a pint of castor oil, after which the following prescription may prove beneficial in some cases: Tincture catechu, four ounces; tincture opium, four ounces.

Mix and give two ounces in pint of water three times a day. The following powder is also indicated: Salol, sixty grains; bismuth subnitrate, seventy-five grains; wood charcoal, sixty grains; tannic acid, thirty grains.

There are many other important diseases of swine, sheep and cattle prevalent to some extent in Tennessee at this time; however, I do not consider this an opportune place to discuss them at any great length. Suffice it to say that as the occasion arises the Commissioner of Agriculture and State Veterinarian will take whatever action we consider right and proper to protect the herds and flocks from the ravages of those diseases which threaten them.

In the enforcement of the rules and regulations of the Agricultural Department we solicit your hearty cooperation.

HOW TO GROW CLOVER AND ALFALFA.

RULES ADOPTED BY EAST TENNESSEE FARMERS' CONVENTION AT
KNOXVILLE.

The East Tennessee Farmers' Convention which was held in Knoxville, May 20, 21, 22, adopted rules for growing red and alsike clover and for growing alfalfa.

The convention's rules for growing red and alsike clover follow:

"Rule 1. Before plowing lime the land, using either two tons of ground limestone or one ton of burnt lime per acre. Disc the application thoroughly into the soil.

"Rule 2. About the first of July turn the land six to eight inches deep and harrow immediately after plowing. This is best done by harrowing before noon all plowing of the morning and before night all plowing of the afternoon. Use a spike-tooth harrow with sharp teeth.

"Rule 3. After plowing apply broadcast, or drill in, 300 pounds of high grade acid phosphate, analyzing 16 per cent, and six to ten tons of manure per acre and disc well into the soil. If no manure be available use 400 pounds of 16 per cent acid phosphate and fifty pounds of muriate of potash per acre.

"Rule 4. Keep land clean and well harrowed, especially after each rain, until about August 20, then as soon as there is a "good season" in the ground sow twelve pounds of the best red clover seed or eight pounds of alsike per acre and cover with one stroke of the spike-tooth harrow.

"Rule 6. Keep all stock off the first fall."

The convention adopted the following as the best method of getting and maintaining a stand of alfalfa:

"The important consideration in getting a stand of alfalfa and in maintaining it are thorough preparation of land at least two months just previous to sowing in August or early September; lime, farm-yard manure, inoculation of the soil or seed, and the proper cultivation after cutting.

"Alfalfa gives largest returns on rich soil—either naturally rich or made so. Select a piece of strong, well-drained land, and immediately after taking off the grain or hay crop (unless you turn under the crop on the few acres you plan to put in alfalfa) manure and break ground deep. After getting the ground thoroughly cultivated apply lime—at least one ton of burnt lime to two tons of crushed or ground limestone per acre. Ground limestone, when convenient, is preferred, and may be applied in larger amounts than two tons per acre.

Do not plant any summer crop, such as peas or beans, but keep the ground cultivated thoroughly to kill weeds, conserve moisture and get an ideal seed bed. Ten days or two weeks prior to seeding to alfalfa apply 500 pounds of high grade acid phosphate and 100 pounds of muriate of potash per acre. Disc this into the soil.

"Land that has been prepared deep should be rolled before seeding. Bad stands of alfalfa frequently occur from covering too deep. Just before sowing seed inoculate the soil by harrowing into the surface as much as 200 pounds per acre of dirt taken from a field where alfalfa is growing successfully. Or you may inoculate the seed by dipping them, while still in the sack, for twenty or thirty minutes, into a barrel of water into which has been stirred fifty pounds of dirt from an alfalfa field. Dry off the surplus water by spreading out in the shade. Double-sow twenty-four to thirty pounds of seed per acre (twelve to fifteen pounds each way) and cover lightly.

"After the alfalfa is up nicely make an application of 100 pounds of nitrate of soda per acre when the plants are not wet with either dew or rain. If any yellowing of the plant should occur in the spring, another application of nitrate of soda will be helpful.

"As a rule alfalfa should be cultivated after each cutting to produce a mulch and control crab grass and weeds. For small areas the disc harrow, weighted and run with discs about straight, and followed with tooth harrow, will do the work. On larger areas a regular spring-tooth alfalfa harrow or spading harrows may be found more economical.

"Four or five cuttings of hay may be secured each year, and as much as three to five tons per acre. With this amount of crop taken from the field something should be put back. Alfalfa getting applications of farmyard manure every two or three years, and some phosphate and potash, ought to give profitable crops for many years.

"On limed lands three to four pounds of alfalfa seed per acre should be sown with all clover and grasses sown in August. If instead of the seeding of clover and grass on grain crops in spring the grain stubble be immediately prepared after the grain is off, and the ground fallowed until the middle of August, good stands of clover and grass will be secured; and where alfalfa is added to the mixture whole fields will in time become inoculated."

INSTITUTE WORK IN WEST TENNESSEE.

County farmers' institutes will be held in every county in West Tennessee, beginning at Trenton, Gibson County, on Monday, July 28, and ending with Paris, Henry County, on Saturday, August 16. The itinerary of the institutes has been announced by R. T. DeBerry of Humboldt, Assistant Commissioner of Agriculture, as follows:

Trenton, Gibson County, Monday, July 28.
Union City, Obion County, Tuesday, July 29.
Dyersburg, Dyer County, Wednesday, July 30.
Ripley, Lauderdale County, Thursday, July 31.
Covington, Tipton County, Friday, August 1.
Bolton College, Shelby County, Saturday, August 2.
Alamo, Crockett County, Monday, August 4.
Brownsville, Haywood County, Tuesday, August 5.
Bolivar, Hardeman County, Wednesday, August 6.
Somerville, Fayette County, Thursday, August 7.
Selmer, McNairy County, Friday, August 8.
Henderson, Chester County, Saturday, August 9.
Dresden, Weakley County, Monday, August 11.
Huntingdon, Carroll County, Tuesday, August 12.
Decaturville, Decatur County, Wednesday, August 13.
Lexington, Henderson County, Thursday, August 14.
Camden, Benton County, Friday, August 15.
Paris, Henry County, Saturday, August 16.

Mr. DeBerry is anxious for each president and secretary of the respective county institutes to write him at once, giving their addresses so he can advise them as to programmes and other matters.

JUNE CROP REPORT.

The crop correspondents of the Department of Agriculture, reporting from eighty-eight of the ninety-six counties of the State, report good conditions among the farmers of Tennessee, with prospects of a most bountiful crop year.

The dry weather since the middle of June has retarded the growth of corn, but the fields are clear of weeds and in good condition, and the rains of the last few days will check any damage threatened by drought.

Reports indicate a larger yield of wheat than 1912 by 50 per cent, and the grain is said to be of the finest quality. An increase is also reported in the average yield of oats.

The cool weather during the first part of the month retarded the growth of cotton, but this staple has come out wonderfully during the last two weeks and the prospects are much better for a good yield.

Apples and peaches, as indicated by previous reports, will show a small yield.

Irish potatoes will be about an average crop, while the production of peanuts will probably show a slight decrease from last year.

The acreage in tobacco is about the same as last year, while the yield will be somewhat smaller, according to reports from the tobacco growing sections.

Live stock is in good condition. Hog cholera is not so prevalent as it was a few weeks ago.

Below is given the summary, for comparison, of the reports of the department for the years 1912 and 1913:

	1912	1913
Cotton, acreage	82	93
Cotton, condition	71	81
Wheat, estimated yield	12	18
Garden, condition	85	82
Oats, estimated yield	21	27
Young Clover, condition	84	69
Meadow Grasses, condition	80	73
Millet, acreage	80	80
Corn, acreage	90	92
Corn, condition	76	83
Tobacco, acreage	85	86
Tobacco, condition	80	76
Apples, condition	60	55
Peaches, condition	84	50
Grapes, condition	87	84
Stock Peas, acreage	84	83
Irish Potatoes, acreage	85	84
Irish Potatoes, condition	82	83
Sweet Potatoes, acreage	85	88
Tomatoes, acreage	87	86
Tomatoes, condition	88	82
Peanuts, acreage	85	77
Peanuts, condition	84	79
Live Stock, condition	88	89
Alfalfa, condition	85	87

JUNE CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT		COUNTY.		Cotton—acreage.	Cotton—condition.	Wheat—estimated yield.	Garden—condition.	Oats—estimated yield.	Young Clover—condition.	Meadow Grasses—condition.	Millet—acreage.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Tobacco—condition.	Apples—condition.	Peaches—condition.	Grapes—condition.	Stock Peas—acreage.	Irish Potatoes—acreage.	Irish Potatoes—condition.	Sweet Potatoes—acreage.	Tomatoes—acreage.	Tomatoes—condition.	Peanuts—acreage.	Peanuts—condition.	Live Stock—condition.	Alfalfa—condition.
A	Alluvial Plain of the Mississippi River and Plateau Slope of West Tennessee.	Lake	75	20	90	35	85	100	100	100	100	100	100	100	75	100	100	100	100	100	90	100	100	100	100	100	100	100
		Obion	100	17	90	40	75	80	100	100	100	100	100	100	100	50	25	90	100	100	100	100	100	100	100	100	100	100
		Dyer	100	80	20	80	40	100	100	100	100	100	100	100	100	100	90	100	100	100	100	85	100	100	100	100	100	100
		Laurel	100	90	15	90	20	85	100	100	100	100	100	100	100	80	45	100	100	100	100	100	100	100	100	100	100	100
		Shelby	100	75	75	40	90	90	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
B	Brown Loam Tablelands, Middle Counties of West Tennessee.	Weakley	100	80	20	70	35	60	65	100	85	100	85	90	80	75	95	90	100	100	100	100	100	100	100	100	100	100
		Gibson	95	35	18	85	30	80	85	95	85	80	85	80	85	80	85	85	100	85	100	75	100	100	100	100	100	100
		Crockett	100	20	75	40	75	75	100	80	75	75	100	100	100	75	75	100	100	100	100	100	100	100	100	100	100	100
		Madison	95	95	20	100	30	95	100	100	90	100	100	100	100	80	89	100	100	100	100	100	100	100	100	100	100	100
		Haywood	100	80	15	80	25	80	100	100	90	100	100	95	75	75	40	30	80	100	20	25	80	90	100	100	100	100
C	Summit Region of Watershed, West Tennessee.	Hardeman	100	50	20	100	40	25	35	75	40	100	95	100	40	30	80	100	20	100	100	85	100	100	100	100	100	100
		Fayette	100	85	20	90	25	90	100	95	100	95	100	95	100	75	65	90	90	100	100	85	100	100	100	100	100	100
		Henry	100	70	18	80	35	85	85	100	90	100	95	100	75	70	90	90	95	100	100	90	100	100	100	100	100	100
		Carroll	100	70	18	85	20	85	60	95	75	100	95	100	75	60	25	95	90	95	100	90	100	100	100	100	100	100
		Henderson	90	95	15	80	35	80	30	80	75	100	80	75	50	70	65	40	100	80	70	90	70	65	100	100	100	100
D	Valley of Tennessee River, West and Middle Tennessee.	Chester	100	85	100	100	100	100	80	100	100	100	100	100	100	15	20	100	100	100	75	85	100	100	100	100	100	100
		McNairy	100	90	90	90	20	95	75	90	95	100	95	100	100	15	20	100	100	100	100	85	100	100	100	100	100	100
		Stewart	100	10	80	20	90	75	100	100	100	100	100	100	80	50	25	100	100	100	100	90	100	100	100	100	100	100
		Benton	100	85	60	35	60	85	100	100	100	100	100	100	65	35	75	100	60	100	100	60	70	75	100	100	100	100
		Houston	100	20	80	25	75	80	90	100	75	100	90	75	90	75	60	90	90	90	100	90	90	100	100	100	100	100

E Highland Rim of Middle Tennessee, Western Subdivision.	Montgomery.	10	90	18	70	63	100	100	75	90	70	60	80	90	80	83	100	100	85	75
	Robertson	20	50	15	30	40	95	90	85	80	75	60	80	80	100	50	100	100	85	85
	Cheatham	20	50	15	30	50	100	60	80	40	40	40	60	60	100	100	100	100	100	100
	Dickson	15	80	20	30	30	100	80	75	75	50	95	55	65	75	100	100	50	100	100
	Hickman	20	60	25	55	20	45	75	60	50	50	55	55	55	100	60	45	40	50	50
	Lewis	20	85	20	35	65	100	80	100	75	20	30	100	100	100	85	95	100	100	100
	Wayne	20	100	25	60	85	100	60	100	100	75	20	100	100	100	75	100	100	100	100
	Lawrence	20	100	25	60	85	100	85	100	100	75	20	100	100	100	75	100	100	100	85
	Macon	20	70	25	60	60	40	70	80	40	30	40	50	40	50	40	55	40	100	60
	Clay	15	85	25	60	75	100	80	100	100	25	40	50	80	90	95	95	100	100	100
F Highland Rim of Middle Tennessee, Eastern Subdivision.	Pickett	20	90	25	75	75	100	95	100	100	25	25	99	99	100	100	100	100	100	90
	Overtown	90	80	12	75	50	80	90	100	100	75	75	75	80	80	90	80	75	75	80
	Jackson	13	80	25	70	80	95	90	90	85	60	45	90	90	95	80	85	100	100	90
	Punnam	18	85	30	75	80	75	95	85	75	25	25	90	90	60	70	30	55	100	75
	DeKalb	20	85	35	90	85	100	95	100	90	25	20	55	55	100	100	100	100	100	90
	White	20	85	35	90	85	100	95	100	90	25	20	55	55	100	100	100	100	100	90
	Warren	18	85	30	80	85	75	95	85	30	30	30	85	95	100	100	100	100	100	85
	Coffee	18	90	30	70	90	75	95	80	100	60	25	80	75	100	100	90	80	100	90
	Franklin	15	65	30	60	60	100	85	100	90	20	25	90	100	100	100	100	100	100	85
	Sumner	20	85	25	50	65	90	85	85	80	65	50	75	75	100	100	100	100	100	90
G Central Basin.	Trousdale	20	100	35	75	80	80	80	100	80	75	40	90	100	80	90	100	100	100	85
	Smith	20	100	30	40	90	60	80	80	40	40	40	90	90	100	70	60	90	90	60
	Davidson	18	80	25	40	50	100	90	100	90	45	30	85	70	95	75	80	85	70	100
	Wilson	20	80	25	40	50	100	90	100	90	60	20	80	80	100	80	80	85	70	90
	Williamson	20	80	25	40	50	100	90	100	90	60	20	80	80	100	80	80	85	70	90
	Rutherford	15	75	20	85	90	90	100	85	70	25	40	60	70	100	100	80	90	100	90
	Cannon	15	80	20	70	85	65	85	70	70	25	50	85	70	85	80	80	85	80	90
	Maury	20	95	25	35	70	100	85	90	75	70	40	95	70	80	85	80	85	85	85
	Marshall	20	75	15	35	35	50	100	85	65	70	40	95	70	80	85	80	85	85	85
	Bedford	15	75	20	10	70	40	100	90	70	20	20	80	70	100	85	100	90	90	85
H Cumberland Table- land.	Giles	20	100	25	75	65	85	100	95	50	35	100	90	85	85	90	70	50	40	100
	Lincoln	18	95	30	85	80	70	95	70	100	90	95	95	90	100	100	100	100	100	95
	Moore	20	85	25	70	85	95	95	85	100	95	95	90	100	100	100	100	100	100	95
	Scott	20	85	25	70	85	95	95	85	100	95	95	90	100	100	100	100	100	100	95
	Pentress	20	90	25	75	75	100	95	100	100	75	90	100	100	100	100	100	100	100	100
	Morgan	20	90	25	75	75	100	95	100	100	75	90	100	100	100	100	100	100	100	100
	Cumberland	20	90	25	85	75	90	90	95	100	75	90	100	100	100	100	100	100	100	100
	Van Buren	20	60	30	50	50	75	85	85	100	75	90	100	100	100	100	100	100	100	100
	Grundy	20	60	35	75	70	100	100	90	100	60	20	90	100	100	70	100	70	90	90
		20	60	35	75	70	100	100	90	100	60	20	90	100	100	70	100	70	90	90

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DISTRICT		COUNTY.																									
		Cotton—acreage.	Cotton—condition.	Wheat—estimated yield.	Garden—condition.	Oats—estimated yield.	Young Clover—condition.	Meadow Grasses—condition.	Millet—acreage.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Tobacco—condition.	Apples—condition.	Peaches—condition.	Grapes—condition.	Stock Peas—acreage.	Irish Potatoes—acreage.	Irish Potatoes—condition.	Sweet Potatoes—acreage.	Tomatoes—acreage.	Tomatoes—condition.	Peanuts—acreage.	Peanuts—condition.	Live Stock—condition.	Alfalfa—condition.	
J Cumberland Table-land and Valley of East Tennessee.	Claiborne	18	85	25	75	75	95	65	65	30	25	80	90	90	75	75
	Campbell	.....	.....	12	50	20	80	50	.....	50	.....	.....	.....	35	60	30	86	80	70	70	.....	90	.....	.....	90	.....
	Anderson	.....	.....	15	80	35	20	70	100	100	75	.....	.....	35	.....	90	.....	80	100	100	100	100	100	100	100	100
	Rhea	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Bedsole	90	90	20	85	25	80	75	80	95	95	80	80	90	85	90	70	85	90	85	90	90	80	80	95	90	
	Sequatchie	.....	.....	20	75	25	50	65	.....	100	75	.....	.....	50	.....	90	100	75	100	100	100	85	.....	.....	90	90
	Marion	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Hamilton	.....	.....	20	70	15	75	50	40	85	75	.....	.....	25	25	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Sullivan	.....	.....	15	95	40	85	85	75	100	85	.....	.....	50	25	95	.....	85	90	100	80	90	.....	.....	90	.....
	Hawkins	.....	.....	25	80	35	80	75	85	100	90	.....	.....	75	45	85	100	100	100	100	100	75	.....	.....	100	.....
K East Tennessee Valley.	Hancock	.....	.....	18	100	30	95	95	100	85	90	100	100	75	60	100	100	100	100	100	100	100	100	100	100	100
	Washington	.....	.....	10	90	30	85	90	100	100	90	.....	.....	60	30	85	90	100	100	100	100	85	.....	.....	95	.....
	Hamblen	.....	.....	20	95	25	90	75	70	95	90	.....	.....	25	25	100	95	90	90	100	100	85	.....	.....	90	.....
	Granger	.....	.....	18	75	25	50	65	60	90	90	.....	.....	40	50	65	45	60	75	80	80	70	.....	.....	80	.....
	Union	.....	.....	20	80	25	80	50	60	90	90	.....	.....	50	25	80	20	80	80	80	80	70	.....	.....	85	.....
	Jefferson	.....	.....	20	.....	25	50	75	75	90	80	.....	.....	.....	.....	100	.....	.....	.....	.....	.....	.....	.....	.....	100	.....
	Knox	.....	.....	30	85	35	85	85	70	100	90	.....	.....	50	50	100	95	100	100	100	100	100	100	100	100	75
	Roane	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Loudon	.....	.....	20	100	25	75	50	100	100	75	.....	.....	25	50	50	50	100	100	100	75	100	100	80	100	100
	McMinn	.....	.....	20	.....	30	90	80	85	100	80	.....	.....	40	25	80	90	100	100	100	50	50	50	90	95	.....
L Valley of East Tennessee and Unaka Region.	Meigs	.....	.....	80	10	15	60	100	100	100	90	.....	.....	75	80	80	90	90	80	85	85	85	85	85	85	90
	Bradley	.....	.....	85	75	20	65	75	80	85	80	.....	.....	80	50	80	90	90	90	80	85	85	10	40	85	.....
	James	.....	.....	100	80	10	40	60	30	40	60	.....	.....	30	90	90	10	15	90	60	40	60	10	40	85	.....
	Johnson	.....	.....	.....	85	25	85	85	100	100	70	.....	.....	80	80	100	100	100	100	100	100	85	.....	.....	90	95
	Carter	.....	.....	.....	85	.....	90	90	100	100	85	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100	95
	Unicoi	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	100	.....
	Greene	.....	.....	13	80	25	60	80	100	100	70	.....	.....	35	60	85	100	100	100	80	80	90	80	90	95	.....
	Cooke	.....	.....	20	70	25	70	75	90	100	85	.....	.....	60	80	100	75	90	95	100	100	80	100	100	100	80
	Sevier	.....	.....	20	100	20	90	100	75	85	90	.....	.....	85	65	85	75	90	90	85	80	90	95	80	90	90
	Blount	.....	.....	20	80	30	90	65	75	90	90	.....	.....	85	50	85	85	95	100	90	90	90	95	95	90	90
State average	Monroe	.....	.....	100	90	30	80	90	70	100	95	.....	.....	45	35	65	75	100	95	50	90	95	.....	.....	95	60
	Polk	.....	.....	85	20	95	35	90	40	90	80	.....	.....	63	45	50	65	75	100	95	50	90	95	.....	95	60
State average		93	81	18	82	27	69	73	80	92	83	86	76	55	50	84	83	84	83	88	86	82	77	79	89	87	

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IN THIS ISSUE:

Poultry Culture in the South. Modern Horse Power Methods.

Middle Tennessee County Institutes.

Rational Production of Farm Power. Fair Dates for 1913.

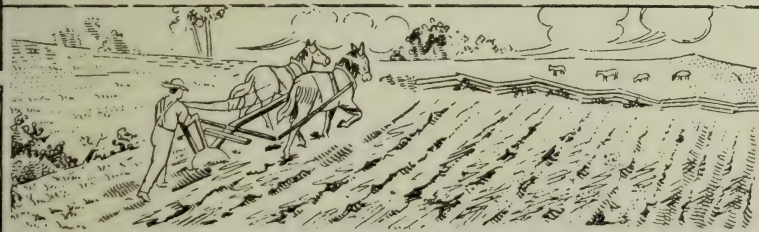
Dairy Management.

Calves and Hogs as a Dairy By-Product.

Home-Making in the Public Schools and Rural Communities.

Licensed Tennessee Veterinarians.

July Crop Report.



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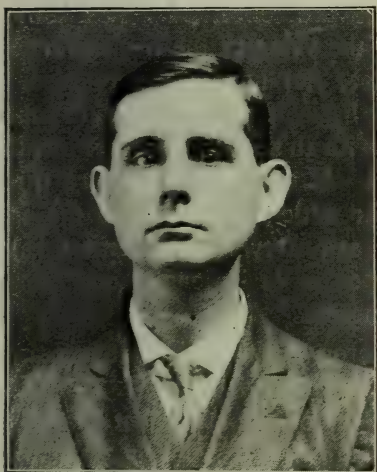
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POULTRY CULTURE IN THE SOUTH.

BY EDWARD M. GRAHAM, ASSOCIATE EDITOR "THE INDUSTRIOUS HEN,"
BEFORE EAST TENNESSEE FARMERS' CONVENTION AND IN-
STITUTE, KNOXVILLE, TENN.



I am glad to be here today to say something in behalf of poultry, that branch of the live stock industry which is rapidly coming into its properly important position in the South—the natural home of poultry.

Until recent years the poultry industry has been sadly neglected in the South, but the time has come when our farmers are beginning to realize that with proper attention, aided by the natural conditions with which we are blessed, poultry

can be made a source of much needed revenue.

I listened with deep interest to the address of your distinguished President yesterday, in which he advocated and urged progressive methods in farm culture. He maintained that the best was none too good for the farmer, and I want to say that I most heartily endorse all the progressive measures suggested by him. The gentleman also advocated the best work stock for the farm, but I wish to go farther than he did in defense of the hen.

In the language of a country editor in the State of Michigan, I wish to say that "the hen can't plow, hoe corn or split wood, but she gets there just the same." The old hen doesn't cost more than the price of two drinks of Knoxville whisky, or a plug of tobacco, but she can earn 8 per cent interest on \$25 in a year and pay her board besides. The fellow who doesn't think a hen can make more money than a grocery store loafer doesn't know much about her. Take an old speckled hen that has no raising at all, one that has been thrown out of a corn crib, kicked off a porch and chased out of the garden by a worthless pup, just take that sort of a hen even, and she will pay expenses and make \$2.00 a year besides, if properly looked after, and that is more than can be said about a lot of cracker-box statesmen in this country who will not stoop to do anything short of running the government.

From the most reliable reports obtainable we learn that the people of the United States pay \$750,000,000 annually for the chickens and eggs consumed. New York City alone spends more than \$48,000,000 annually for poultry and eggs. Next to the cow the hen is the best farm employe we have, exceeding even the earnings of the sheep and the horses so far as the products are concerned. The United States Secretary of Agriculture gives the value of the hen's products at \$300,000,000, but of course he does not have complete reports. However, taking the \$300,000,000 as a basis, it is three times as much as we spend on our whole navy, and with this income for six months we could pay for the Panama Canal. It would only require three years for the old hen to wipe out our national debt. Had the egg product of last year been placed on egg-carrying refrigerator cars, the string of cars would have been 900 miles in length, and would have reached from Chicago to Washington.

Census reports show that the egg crop of the Southeast increased in value nearly \$23,000,000 during the decade ending 1909. The same source of information is authority for the statement that Virginia, North Carolina, South Carolina, Georgia, Florida, Alabama, Mississippi, Kentucky and Tennessee—with the addition of the adjoining States of Maryland, West Virginia and Delaware—produced in 1909 exactly 27 per cent of the fowls raised in the entire country. In the same territory the production of eggs increased during the same period of time more than 26 per cent, and the value of the egg crop increased 122 per cent. In 1899 the egg crop of the Southeast was worth \$18,015,728. Ten years later the aggregate value was \$40,936,844—doubled, and with several millions to spare. The egg product in Tennessee alone in 1899 was 31,807,990 dozen; in 1909 the total was 42,043,104 dozen. These figures should be sufficient proof that the poultry industry of the Southeast is becoming, and rapidly so, a very important revenue producer.

There are good reasons why poultry raising in the South is receiving more attention than it has heretofore. Chief among these reasons are that we have a moderate rainfall; short winters with practically no temperatures below zero. The long growing seasons afford generous crops of varied feeds; poultry can have free range nearly any month in the year; soils are particularly adapted to the health and comfort of poultry; there is land that can be purchased for a reasonable figure, and splendid markets; the price of eggs has advanced in recent years and the price continues to be a fair one.

Shipments to Northern markets have been largely increased since

railroads have inaugurated the "pick-up" or "concentration" system, by which cars are "cut out" at certain stations without extra charge to receive part carload lots. Thus a car may be partially filled and sent on to the next station and there filled by another shipper and then forwarded to its destination.

As another evidence of the great possibilities for poultry in this country we refer to Hamblen County. So important has the poultry industry become there that a special poultry train is operated weekly from Morristown to New York, and during the busy seasons there are frequently two solid trains a week carrying chickens, eggs, geese, ducks and turkeys to Eastern markets. In 1911 the poultry shipments from Morristown aggregated \$2,000,000. The 1912 holiday shipments of turkeys from Morristown were valued at \$400,000. Yet, with this volume of business, the supply has not kept pace with the demand.

It is as necessary to success to have pure-bred poultry as it is to have thoroughbred live stock of any other kind. A mixed breed of poultry is never the best breed, and if you would have the best breed, your poultry must conform substantially to standard requirements. This is an age of progress in poultry raising as well as in farm culture, and the mongrel fowl is rapidly being replaced by pure-bred stock.

No good farmer would think of continuing the raising of Arkansas razorbacks when they can have thoroughbred hogs that will produce almost double in meat value, and at the same time not increase the feed bill. The same rule must apply also to poultry. Those who are raising chickens are beginning to learn that it is just as easy to have hens that lay from 150 to more than 200 eggs per year as it is to have hens that lay only from fifty to 100 eggs per year. In both cases the cost of feeding is practically the same. One poultry man in Pennsylvania from a flock of 135 hens obtained the average of 198 eggs from each hen in one year. This is only one instance—many others could be cited.

In selecting foundation stock for your poultry yard it will pay you to obtain the best strain of the breed you desire. If you want to raise poultry to market, you should get one or more of the larger breeds, but if you want eggs be sure you purchase a strain that has been bred up to a high standard of excellence for egg production. It is not so much what particular breed of fowls you have as it is the best strain of the breed that suits your fancy. Nature, aided by scientific mating and breeding, has given you 130 classes of domestic fowls,

both land and water varieties, and it should not be a difficult matter to suit your fancy.

The man who would breed fancy fowls for high prices is most unwise to try to do this nice work without all the tools necessary. Chief among these is the Standard of Perfection. Yet with one tool alone he will be too heavily handicapped. Let him get every good tool he can acquire. Study poultry culture and use progressive means. Be sure you subscribe for one or more first class poultry journals and thus keep posted on all lines of interest to the poultry world. If you have good poultry and a surplus of either stock or eggs for sale, advertise your products. Remember that the old hen has one good trait that is not possessed by any other kind of live stock—she cackles when she lays; she advertises the fact in order that her companions of the barnyard may rejoice with her. Don't be afraid to let the buying public know what you have to offer; then if you would make a success as a poultry man or as a farmer, attend the poultry shows and exhibit your birds. A string of ribbons has much to do with the sale of your stock.

If there is one characteristic which, more than others, marks American farmers as a class it is their appreciation of the utility side. And it is the American farmer, more than the man of any other class, who should be interested in the hen; who is indeed interested in her. Hence it goes without saying that the discussion of her from the utility standpoint ought to touch him to the quick, even though not so sensational as the show room story. The practical man who does not care to be a fancier does not himself need the high-priced birds, but he makes a mistake when he thinks the fancier's work is nothing to him. His very best hold is to build his work on a fancier's fowl that has many practical points, because he can work from this along the practical line without the handicaps of the fancier. When the utility poultryman believes and affirms that he could get along as well, if not better, without the fancier, he forgets that the fancier made the breeds we now have and brought them to their present perfection. He forgets that virtually all the men and women who are dispensing poultry instruction are fanciers in greater or less degree.

The utility cannot get along successfully without the aid of the fancy, and the same is likewise true if the problem is reversed. The utility poultrymen only have the A, B, C rudiments of poultry culture; the fanciers have gone at least to the D, E, F of scientific laws governing poultry culture, and it is to be hoped they will continue to make further progress along these lines.

As your distinguished President on yesterday advocated intensive farming, I must advocate intensive poultry culture. In fact, it is the keynote of poultry success. No man gets the greatest returns for time, labor, material, space and money invested without intensive methods. The poultryman succeeds as he avoids wastes. Study the economic factors and you will be amply repaid. If we would have better poultry we must fall in line with the progressive measures suggested, properly stock and equip our plants and by intelligent and systematic effort raise fowls, each of which yield an annual profit after paying for its maintenance.

Ladies and gentlemen of the convention, the opportunity is yours. Will you grasp it and work for better poultry as well as for better farming? The old hen is one of the best friends to the farmer's wife. By her faithfulness she lays the eggs that are marketed, and the proceeds go to supply many household necessities which without the aid of the hen would be a heavy drain upon the purse of the farmer.

Let's quit abusing the hen and give her that consideration to which by every law of reason she is entitled.

Do not keep surplus cockerels. Get them into condition for market at once.



Cooper Lake, Cumberland County.

MODERN HORSE POWER METHODS.

WAYNE DINSMORE, SECRETARY PERCHERON SOCIETY OF AMERICA, BEFORE THE EAST TENNESSEE FARMERS' CONVENTION, KNOXVILLE, TENN.



Suppose that we had a well 220 feet deep, just outside of this pavilion, and at the bottom of that well a man weighing 150 pounds. If we bring a rope from that man up out of the well, extending it over a pulley, would it be possible for any man in this audience to hitch himself to the end of the rope and pull out of the well the man at the bottom of it? In other words, is there a single man here who believes that he could, by attaching a harness around his shoulders and breast,

hitch himself to the end of a rope and pull a 150-pound man out of a well 220 feet deep. I hear no takers, and it is evident that none of you are of the opinion that you could accomplish such a pull. In this you are right. There is not a man here who could pull such a weight as I have described, although it is possible that there may be a few men in this audience who could, by taking another man upon their shoulders, thus weighting themselves to the ground, make such a pull as I have mentioned; but it would be impossible for any man to exert himself to this extreme limit for any considerable length of time.

How much can a horse pull? Can he pull his own weight? If we put a 1,200-pound horse at the bottom of a well 220 feet deep, and from that horse extend a rope or cable over a pulley, would it be possible to hitch another horse weighing 1,200 pounds to the end of such rope and pull the first horse out of the well? It would not. Tests that have been made show that no horse can pull his own weight. The utmost that a horse can pull is about two-thirds of his weight, and he can exert this pull only under the most favorable circumstances and for a brief time. In actual practice it has been found that the maximum pull for the average horse is about one-fifth of his own weight. In other words, a horse weighing 1,500 pounds may be expected to exert a pull of about 300 pounds at the maximum, but such a pull cannot be long continued, and the pull which horses exert in

their daily work seldom exceeds one-tenth of their weight. When horses are required to pull more than this they are overloaded.

Those of you who have pulled in tugs of war know that it is impossible to exert yourselves to the limit of your strength for any considerable length of time. It is necessary to pull and then rest. The greater the pull, more frequent and the longer are the rests required. The same thing is true with horses or mules. You may require a team of light weight mules to pull a very heavy plow, exerting themselves to the limit of their strength, but under such conditions long and frequent rests are necessary, or if the animals are crowded straight through they will soon become exhausted and it will be impossible for them to move the load which you have required of them. The most work is accomplished when the animals are not overloaded. With this general knowledge, the question immediately arises: What is a proper load for horses of any given weight in plowing, discing, working on the self-binder, etc? How much of a pull is required by these various implements? The pull of farm implements varies according to the condition of the soil, crop, etc.

The Iowa Experiment Station in extended tests found that in plowing two-year-old clover sod, cutting a furrow approximately five and one-half inches deep by fifteen inches wide, a pull of 296 pounds was required. To operate this plow in a satisfactory manner day after day will require three 1,000-pound horses or two 1,500-pound horses. The same experiment station found that to pull a plow cutting a furrow approximately six and one-half inches deep by twelve inches wide required a pull of somewhat in excess of 600 pounds, the draft increasing decidedly with increased depth of furrow. To do the last plowing properly will require four 1,200-pound horses or three 1,600-pound horses, and in either case the horses would be pulling more than the standard load.

The International Harvester Company found that it requires a pull of from 350 to 450 pounds to operate a six-foot binder in ordinary grain where soil conditions were favorable. As you all know, it requires four 1,200-pound horses or three 1,500-pound horses to handle such a binder satisfactorily.

It is possible in farming operations to operate various farm implements with teams that are too light to do the work properly, but the inevitable result is lost time. In a ten-hour day spent in plowing about two hours will be lost in turns and stops where the horses are not heavy enough and sufficient in numbers to permit of steady work. Where the team force is insufficient, so much time is lost resting

horses at the ends that the actual working time will oftentimes not exceed six hours. What this means can best be shown by an illustration from actual practice.

Last week I made a trip into the country, a little distance west of Chicago, and visited a farm owned by a friend of mine. This spring in purchasing teams he had an opportunity to buy some light-weight horses at a rather low price, and draft horses cost so much that he decided to purchase the light teams. He did so. At the time I was at his place he was plowing corn stubble ground with two sulky plows, cutting furrows five and a half inches deep by fourteen inches wide, and was using three horses on each plow. The ground was rather dry and the pull was so heavy on the teams that the men found it necessary to rest them for four or five minutes at the end of every round. Even with this amount of rest the horses were lathered and were plainly pulling more than they could operate to the best advantage. The land being turned per day amounted to about two and a half acres per plow, and the cost as nearly as it could be figured stood as follows:

One team of 1,200-pound horses.....	\$3 00
Third horse, same weight.....	1 50
One man's time.....	1 50
<hr/>	
Cost per day.....	\$6 00
Ground plowed per day per plow	2½ acres
Cost per acre.....	\$2 40

Other farm operations were being carried out on practically the same basis. Another team working on a disc was also too heavily loaded and it was necessary to rest nearly as much as in the case of the horses on the plows. So much for farm operations with light-weight horses.

Near Blandinsville, Ill., lives a farmer named Argenbright. Mr. Argenbright is operating about 600 acres and is known as one of the best farmers in that part of the State. He uses gang plows consisting of two fourteen-inch plows. On each gang he uses four mares, all of which will average over 1,600 pounds—some of them are over 1,700 pounds. Mr. Argenbright plows on an average six acres per day with each outfit, providing either he or his son is in the field, and when the weather was cool and soil conditions favorable he has plowed from seven to eight acres per day with each gang. Mr. Argenbright reports that with the heavy teams which he uses it is possible to plow right straight through all day with just a minute's rest at the end of each furrow. His fields are in forty-acre tracts and

he back-furrows his land, plowing it in twenty-acre lands. This makes his furrows approximately a quarter of a mile long and enables him to plow a large amount of ground with few turns. It is only necessary for the teams to walk two and a half miles per hour for about eight hours to turn six acres with the implements which Mr. Argenbright has, and heavy draft horses with their long swinging stride will do this without being hurried. The cost per acre in Mr. Argenbright's case stands as follows:

Two teams at \$3.00 per team.....	\$6 00
One man at \$1.50 per day.....	1 50
<hr/>	
Total	\$7 50
Ground plowed	6 acres
Cost per acre.....	\$1 25

Other farm operations are conducted on a proportionate cost basis. In discing he uses long discs and in seeding uses ten-foot drills and he not only covers more land per round, but is also enabled to continue his work more steadily than in the case of my other friend who is using light-weight horses.

To put the matter roughly, I may say that Mr. Argenbright is conducting his farm operations at a cost of from one-half to one-third less than the gentleman who is using light teams referred to, and you will find that this will hold true in all kinds of farm operations, for there is scarcely any work done on the farm where the heavier teams will not do the work a little better and a little more rapidly than light teams can possibly do it.

Aside from the fact that the heavy draft horses are more efficient in actual farm operations than light-weight teams, we find that by using draft mares for the farm work it is possible to secure an added return. The experience of Mr. Argenbright and that of hundreds of other successful Illinois and Iowa farmers shows conclusively that draft mares can be used to do the farm work and that they will also rear good colts if intelligently handled. Roughly speaking, the man on the small farm, say from 100 to 120 acres, needs six good draft mares. With these he can accomplish his farm work and should raise four colts per year, for we find that in horse rearing an increase of 66 per cent is about all that we can expect. The cost to rear the draft colts three years of age has been found to be from \$125 to \$150, allowing for cost of service fee and all other expenses. These same colts will at three years of age bring you from \$200 to \$250, so that the farmer who is using draft mares in his farm operations may

reasonably count on an annual increase of from \$200 to \$400 for colts sold from the mares used in his farm work.

You men here in the South will probably prefer to breed to jacks and to sell the colts at weaning time, for mule colts are readily sold at that age and bring good prices. Kansas farmers last fall sold hundreds of mule colts at weaning time to Tennessee buyers who went west for the purpose of purchasing such colts to be shipped to Tennessee and reared on your good bluegrass pastures. For these colts prices ranged from \$65 to \$140, and the average for mule colts out of good grade mares weighing 1,400 pounds or over was over \$100. In every case mule colts out of draft mares brought much more money than the colts out of light-weight mares. It certainly will not cost you over \$50 to bring a mule colt to weaning time, even including service fee, and if you sell that colt at weaning time for \$100 you have a clear profit of \$50 at the least calculation. Four such colts will bring you a profit of \$200 or over, and this adds to the efficiency of your farm operations.

Your State needs draft mares. You need them because they are more efficient in farm work. You need them because they will produce colts in addition to doing the farm work. You need them because you are today buying more than one-half your work stock. You need them because your stock men are going into Illinois, Missouri and Kansas to buy draft horses and young mules to be grown out of your own pastures. You need mares because thousands of dollars are being sent out of your State for the purchase of this work stock, which might just as well be spent within your own State if you were but producing the work stock needed. You need draft mares because with your good bluegrass pastures, your rolling land, you have thousands upon thousands of acres which are better adapted to pasture purposes than any other farm use, and by rearing horses and mules you can utilize these pastures to good advantage and at the same time build up the fertility of your soil. Your experimentalists and your leading farmers all concede that your land needs barnyard manure—it needs humus and by keeping horses and mules you can greatly increase the supply of humus in your soils.

The question naturally arises: What feasible method can be adopted to improve the horse stock of Tennessee? There are two distinct lines of procedure which you may adopt. The first is to go directly into the Northern and Western States and buy good grade draft mares, well adapted to your purposes. The second is to improve your native stock by breeding your light native mares to good draft

stallions. The first method is, of course, the quicker, but will cost a little more money. The second line of procedure will give you results in from three to four years, for if you breed your light native mares to good Percheron stallions you will have available within three or four years fillies weighing from 1,200 to 1,300 pounds that are of good type and quality. One more cross of a Percheron stallion on these young mares will give you a still better type of mare, weighing around 1,400 or 1,500 pounds, particularly valuable for farm work and mule production. I am not here to tell you what line of procedure you should adopt, for your local conditions, your funds, etc., must govern, and you will have to adopt whichever line your circumstances indicate to be the best.

I do want to suggest this, however: If you do go North or West and buy grade draft mares, purchase mares of the right type. I do not believe that you are yet ready for extremely heavy horses. The experience of those men who have taken draft mares to the South indicates that the medium weight mare, weighing around 1,500 to 1,600 pounds with the right type and quality, is best adapted to your purposes. The experience of these men has shown very definitely that coarse, sluggish, lymphatic mares are not good mares for the South. You want mares like these best mares that Dr. Jacobs has purchased for the Tennessee Experiment Station. Here is one pair of mares that has worked three years on your farm and experiment station. They have stood work as well as your native horses and have done much more because of their superior strength. This best ma erstanding over here next to the side of the pavilion is a mare weighing approximately 1,550 pounds; she stands 16-1; she has enough length of leg to take a long swinging stride in field work. In addition to this she is a mare of excellent draft type that all of you may well get in your mind's eye as a type to purchase by. She is a mare with quality, clean limbed, clean in the joints, with no tendency toward coarseness of hair, or toward gumminess in the legs and with this she has plenty of ambition and spirit. Slow, sluggish, lymphatic mares are not the kind for your conditions and I think that in all cases where men have reported unsatisfactory results it has been due to the fact that they have purchased the wrong kind of draft mares, for the reports which I have had within the last two weeks from all of the Southern colleges and experiment stations are unanimous to the effect that good grade Percheron mares with spirit, quality, action and with weight around 1,500 to 1,600 pounds have given splendid results in every one of the Southern States.

It is needless to say that pure-bred Percherons are needed, and

much needed, throughout all parts of the South, but I would not make any general recommendations to the Southern farmers along this line. The breeding of pure-bred horses, like the breeding of other classes of pure-bred stock, is a business in itself, and those of you who contemplate embarking upon the breeding of pure-bred Percherons should write to me and secure complete information, for the subject is separate and distinct, and would require exhaustive and separate treatment. I shall be glad to see and talk with any of you at any time today in regard to any of these matters which I have brought up, and I may add further that I will furnish to any of you who desire same a complete list of members of the Percheron Society, totalling around 5,000 names. This list will be very valuable to you if you contemplate purchasing grade or pure-bred Percherons. Our members are for the most part located in good horse communities and by writing to some of those who are located reasonably near you you will be able to locate such stock as you desire.

COUNTY INSTITUTES FOR MIDDLE TENNESSEE.

Assistant Commissioner of Agriculture Jesse Tomlinson has announced dates for holding county institutes in Middle Tennessee. The points selected for holding these institutes are places which were not reached by the Agricultural Special last year.

A large number of speakers will be present at these meetings, including Commissioner of Agriculture T. F. Peck, State Veterinarian Dr. Geo. R. White, Chief Feed and Seed Inspector A. L. Garrison, Apiary Inspector J. S. Ward, State Entomologist G. M. Bentley, and others.

Following are the places and dates of the institutes:

Waynesboro, Tuesday, August 19.

Linden, Thursday, August 21.

Chapel Hill, Saturday, August 23.

Lafayette, Monday, August 25.

Gainesboro, Wednesday, August 27.

Celina, Friday, August 29.

Byrdstown, Saturday, August 30.

Jamestown, Monday, September 1.

Spencer, Monday, September 8.

Tracy City, Thursday, September 11.

Crossville, Saturday, September 13.

Dover, Monday, September 15.

Livingston, Wednesday, September 17.

Woodbury, Friday, September 19.

THE RATIONAL PRODUCTION OF FARM POWER.

PROF. MILTON JARNAGIN, STATE COLLEGE OF AGRICULTURE, ATHENS,
GA., BEFORE EAST TENNESSEE FARMERS' CONVEN-
TION AND INSTITUTE.

Weight in the collar has an important bearing on the prosperity of the farmer. The exact type of horse or mule that is best suited to the varying demands of the farm has not been settled, though statistics reveal the fact that there is a shortage of work stock on the average farm in Tennessee at the present time. We have been inclined to class ourselves among the horse-breeding States. On the other hand, the claim is not well substantiated when it is borne in mind that there are 1.12 horses and mules of all ages on the average farm at the present time. According to the 1910 census there were 246,012 farms. In the same census there were reported 153,838 horses, including mares, stallions and colts of all ages, and 123,887 mules of all ages, making a total of 277,725 for the entire State, which means practically a horse or mule to the farm. If the colts below work ages were counted out there would be less than a mature work animal for each farm.

In 1850 the average farm for the State contained 261 acres. In a period of sixty years the average farm had decreased to 81.5 acres. Does anyone believe that eighty acres of land can be worked to the best advantage with less than one mature horse or mule? Experience shows that one horse is required for from twenty-five to thirty acres. On this basis there should be three animals of work age on the average farm. Furthermore, it is contended that for the most profit mules and geldings should be sent to the market and only mares of breeding usefulness retained in the country. The average farm with three mares should raise two colts in the year. There should also be two yearlings and two two-year-olds, making a total of nine horses or mules per farm, which would give a grand total for the State as a whole of 2,214,108, or, in other words, approximately ten head where there is one today. It is a significant fact that for the last census year only 10 per cent of all of the farms raised horse colts and 5.7 per cent raised mule colts. In many instances the same farm reported both horse and mule colts, so that the total number of breeding farms in the State will be not far from 12½ per cent. In the light of the actual shortage and the number of farms producing colts even the most timid need have no fears relative to engaging in horse breeding.

Practically all of the land that is suitable for farming purposes within the State is in use. In 1850 71.2 per cent of all of the land in the State was reported as being in farms. Sixty years later, or in 1910, only 75.1 per cent of the land was used for farming purposes. During the last decade there was an actual decrease of $1\frac{1}{2}$ per cent of the land devoted to farming purposes. In sixty years there has been an increase of 117.9 per cent in the population and an increase of 3.9 per cent in the amount of land used for agricultural purposes. This means but one thing and that is in order to feed and clothe the increased population every acre of land must be made to produce to its fullest capacity.

During the past ten years the labor bill on farms in Tennessee increased 78.6 per cent. This constantly increasing expense can only be checked by the use of sound work stock, together with heavier or more efficient farm machinery. One man can drive four heavy draft mares and do a greater amount and higher standard of work than if he were driving one animal hitched to a light, inferior machine. The farmer who has only team power enough to cut a furrow ten inches wide must needs walk 9.9 miles for each acre plowed, and by walking sixteen miles in the day he will plow but 1.61 acres. If he could double his team power and plow two furrows of the same width it would be necessary for him to walk only 4.95 miles to plow an acre as he could easily plow 3.26 acres within the day. In the cultivation of a swath forty inches wide he would have to drive only 2.47 miles to cover an acre, or in a day's work of 16 miles he would cover 6.46 acres. The man who has equipped himself so that he can cover an acre every time he drives 2.47 miles will earn more in the season than the man who has to walk 9.9 miles to get over an acre of land.

It has been shown that the population of the State is steadily increasing, that the average size of the farms is rapidly diminishing and that all of the land suitable for agricultural purposes is occupied. Since we cannot broaden our acres it will be necessary to deepen them. Here again weight in the collar is demanded. The value accruing from deep preparation is familiar to all. A specific example of this is shown by results obtained on the Georgia Agricultural College farm. A piece of our impervious clay land has been broken to an average depth of about four inches. The first year it was planted to silage it gave a yield of five tons per acre. The next year it was broken to a depth of ten inches and yielded nine tons of silage per acre. The following year it was broken an average depth of fourteen inches and produced fifteen tons of silage per acre. On this theory

it is possible to make the average farm of eighty acres produce as much as is now being produced on 240 acres of land.

The argument most often advanced against deep preparation is the cost of power. On the other hand, it is contended that per cubic foot of dirt turned under deep plowing is relatively cheaper than shallow plowing, to say nothing of the increased yielding capacity of the deep seed bed. From 45 per cent to 55 per cent of the power necessary to draw a plow is consumed by the share and shin which cuts the furrow slice loose. But little of the furrow is consumed by the moldboard, which turns the furrow slice over after it is cut loose from the remaining soil.

All other things being equal the smaller the cutting surface in proportion to the size of the furrow slice the more economical will be the plowing. If the furrow is five inches deep and ten inches wide there is a cutting edge of fifteen inches. Thus five inches in a perpendicular direction are cut by the shin and ten inches in a horizontal direction are cut by the share. There would be fifty square inches in a cross section of the furrow. In this case for one inch of cutting surface there would be cut loose in the furrow slice three and one-third square inches. If a furrow ten inches wide and ten inches deep were plowed there would be a vertical cutting edge of ten inches and a horizontal cutting edge of ten inches, making twenty inches of cutting surface. There would be 100 square inches in a cross section of the furrow, so that for each inch of cutting edge there would be five square inches in the furrow slice cut loose. Accordingly the power used to draw the plow would be less per cubic foot of earth turned over in the deep plowing than in the shallow plowing.

Prof. Ocock, of the Illinois Experiment Station, has conducted valuable experiments along this line. He found that with the plow running at an average depth of four inches it required a pull of 5.17 pounds for each square inch in the furrow slice, but that where the plowing was done at an average depth of eight inches it required a pull of only 4.41 pounds for each square inch in the furrow slice.

Since increased team force will enable the farmer to cultivate more acres in a day, plow deeper and at a reduced cost per unit of work done. Certainly all thinking farmers should begin to turn their attention to the most economical and most feasible means of increasing the quality and efficiency of farm teams.

Heavy draft mares are the only solution of this momentous problem. During the past four years we have been directly or indirectly instrumental in placing approximately 400 draft mares on Southern

farms, and in practically every instance they have made good. Where the failures have occurred they are chargeable to the owners and not to the mares. These animals are not fool proof, will not perform the double function of matron and worker on half rations and cannot be fed molded, mildewed or unsound food.

We have also placed a number of registered draft stallions. These stallions have been purchased on the cooperative plan in stock companies, but they have been bought directly from the breeders and not dealers. We have found that from 50 to 300 per cent can be saved in the purchase price of a stallion in this way.

The "\$3,000.00 peddled stallion" has worked materially against the development of horse breeding in the South. Satisfactory stallions can be bought and delivered on Southern farms at from \$500.00 to \$800.00, depending on age and individuality.

It is a perplexing problem as to whether or not Tennessee farmers should direct their energies toward the production of horses or mules. On the other hand, it is contended that there are not sufficient big, strong-boned, roomy, sound mares in the State at the present time to produce an adequate supply of mules that will command the highest price on the market, so that the first effort should be directed at getting bigger mares on the farms. This can best be accomplished by the introduction of desirable big draft stallions.

The best of the native trotting-bred mares, weighing from 1,100 pounds up, will be ideal for breeding to these horses. A stallion standing not less than sixteen hands three inches high and weighing not less than 1,700 pounds should be used. It is reasonable to expect that the fillies from this mating will be from 200 to 300 pounds heavier than their dams, depending on the character and amount of feed they received as youngsters. The first cross will make excellent mule mares, though it would be better to superimpose another cross of draft blood before the mule breeding was undertaken.

For the past five years the Mississippi Experiment Station has been conducting valuable breeding experiments along this line. They have used grade Percherons, Clydesdales, Hackneys, standardbred and thoroughbred mares. They have bred them to the best Spanish and Mammoth jacks. The selling price at maturity has been the measure of the value of the animal. Without exception the heavier the dam the more farmers have been willing to pay for the progeny.

For those who are not willing to take the longer course of breeding the light native mares into heavier stock by the continued use, generation after generation, of draft stallions, it is a feasible plan

for them to go to draft horse breeding centers and purchase foundation stock. On the other hand, the beginner's pathway is beset with many pitfalls. We are all human and some of the horse dealers are even a little more than human.

One of the most common mistakes is for the farmer to go into the cities and purchase foot-sore, discarded, city mares. The fact that they have gone unsound is proof of the fact that they are not fit to be used for breeding purposes. Above all things it has been the history of these mares that fully 75 per cent of them prove shy-breeders or non-breeders when they are sent back to the country. If sound mares are purchased in the market places many non-breeders are secured in this way. A good breeding mare is such valuable property that she will be kept in the country, so that if a desirable big mare above six years old is found in the market the presumption is that she is an unsatisfactory breeder or she would have been retained in the country.

The safest and most economical plan to follow is to purchase untried two- and three-year-old fillies. The owner knows no more of their future usefulness as breeders than the prospective buyer and he has at least an equal chance with the seller of getting satisfactory breeding mares. These fillies can be purchased at from \$25 to \$50 less than the mature mares and will become accustomed to the Southern climate more readily than the older individuals.

Fifteen hundred pounds should be the minimum weight for farm mares, and there is practically no limit to the maximum weight so long as quality, finish and courage are maintained. No one will attempt to argue that a small man is capable of doing a greater amount of heavy work than a well-proportioned, active, big man. But the idea seems to have gained prevalent acceptance that because a horse is big he is inferior. I have seen thick-hided, coarse-haired, long-backed, gangling, angular, heavy horses that would not suit hilly land or a hot climate, but these are mongrels or misfits that would not suit any climate. The drafters with good hair, bold eyes, active well-carried ears, deep ribbing, short backs, and straight, sound underpinning will prove the most profitable and most economical of all farm power.

That the South can produce a high standard of draft horses has been amply demonstrated. A 1,550-pound grade Percheron mare owned by the college farm did as much work in the field as any mule during the past year. She was laid out of work seven days before foaling. The colt weighed 735 pounds the day before it was six months old and sold for \$162.50. We produced a draft colt that weighed even 900 pounds at eight months and nineteen days of age. We have made it a practice to break all draft colts the fall they are two years old. Three of them will do the work of two mature horses

during the first fall. As three year olds they are put back into two-horse teams and make most satisfactory farm workers.

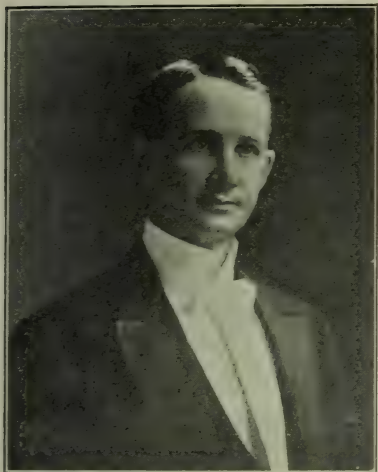
With the increased weight the abundant feeding must necessarily follow. For best results it will be necessary to feed about one and a quarter pounds of grain per 100 pounds of live weight in the colts, together with all the hay they will consume during the winter months. Unless the pasture is exceptionally good it will pay well to feed a limited amount of grain to the growing colts during the grazing season. This may strike some as extravagant, though the object of this more liberal feeding is to develop the horse so as to put him in the collar or on the market a year sooner and thus cut off the ration of maintenance. That more liberal feeding can be practiced is amply demonstrated by the fact that during the last census year Tennessee farmers sold \$3,141,000 worth more feed than they purchased. If this amount of feed had been fed through well-bred horses it would have been worth double the amount to the farmers.

FAIR DATES FOR 1913.

Postoffice.	County.	Dates.	Secretary.
Alexandria	DeKalb	Sept. 4-6	Rob Roy.
Celina	Clay	Sept. 10-12	W. F. Brown.
Carthage	Smith	Sept. 11-13	S. M. Corley.
Coal Creek	Anderson	Sept. 23-25	W. L. Wilson.
Concord	Knox	Sept. 9-12	F. H. Boring.
Cookeville	Putnam	Aug. 28-30	A. P. Barnes.
Columbia	Maury		H. W. Thomas.
Deer Lodge	Morgan	Sept. 23-26	T. F. Hayworth.
Dickson	Dickson	Oct. 7-11.	H. G. Sensing
Dresden	Weakley	Oct. 15-18	W. R. McWherter
Dyersburg	Dyer	Sept. 30-Oct. 4 ..	W. C. Paris.
Fayetteville	Lincoln	Aug. 27-29	F. M. Bledsoe.
Gallatin	Sumner	Aug. 28-30	W. Y. Allen.
Humboldt	Gibson	Sept. 17-20	C. W. Rooks.
Jackson	Madison	Sept. 30-Oct. 4 ..	W. F. Barry.
Kingston	Roane	Sept. 30-Oct. 3 ..	S. R. Sparks.
Lafayette	Macon	Aug. 21-23	M. H. Allen.
Leoma	Lawrence	Sept. 23-26	N. L. Powell.
Lewisburg	Marshall		C. C. Wallace.
Manchester	Coffee	Sept. 26-27	W. M. Hickerson.
Memphis	Shelby	Sept. 22-27	F. D. Fuller.
Morristown	Hamblen	Sept. 3-5	C. B. Weesner.
Murfreesboro	Rutherford		B. B. Kerr.
NASHVILLE	Davidson	Sept. 29-Oct. 4 ..	J. W. Russwurm.
Newport	Cocke	Aug. 26-28	Jno. M. Jones.
Paris	Henry	Oct. 8-11	R. H. Hudson.
Pulaski	Giles	Sept. 23-26	J. D. Rhea.
Rhea Springs	Rhea	Oct. 6-11	H. B. Payne.
Rome	Smith	Aug. 14-16	A. T. Williams.
Selmer	McNairy	Oct. 14-17	W. K. Abernathy.
Shelbyville	Bedford	Sept. 17-29	W. E. Gant.
So. Pittsburg	Marion	Oct. 14-17	W. H. Wilson.
Spring City	Rhea	Oct. 7-11	J. W. Fischesser.
Sweetwater	Monroe	Sept. 16-19	Jas. R. Love.
Tullahoma	Coffee		John W. Harton.
Union City	Obion	Sept. 10-14	J. W. Woosley.
Winchester	Franklin	Sept. 2-5	T. B. Anderton.

DAIRY MANAGEMENT.

DR. C. M. MORGAN, BEFORE EAST TENNESSEE FARMERS' CONVENTION
AND INSTITUTE, KNOXVILLE, TENN.



The trouble with a great many of the dairy farms is that there is no dairy management. Some farmers keep a few cows, as they consider them like the little hen, "just a necessary evil." Yet, in my judgment, there is no side line on the farm that pays as well as having a few first class dairy cows.

The older men of the audience can well remember the days when the foreigners were settling up the Northwest. These would come to this country, perhaps work two or three years until they learned the language; then they would rent a farm a few years and eventually own a farm. These people usually built a very small house, but a large barn, and it is always invariably true that they have quite a herd of dairy cattle, for with dairy stock they had a steady income. They raised practically all the calves and a large number of hogs, and very seldom purchased an article that could be raised on the farm.

One great trouble with the dairy industry in East Tennessee is that a cow is a cow. I know personally where men have sold a \$100 cow for \$50; then they will ask \$45 for a \$20 cow. The man who bought the \$50 cow knew approximately what she is worth, where the man who sold her ought to have known what she was worth, and could have known had he used the milk scales and a Babcock tester. Had he used the scales of course he would not have sold his cow at one-half her value, but he would have sold the poorest cow.

Another system of poor management is that a bull is a bull. We all know that a good pure-bred animal is one-half the herd. We also know that a scrub bull is the whole herd.

A record that was kept shows us the value of keeping pure-bred sires that come from families that are high producers. We have a record that shows a common grade cow made a yearly profit of \$13. The daughter, sired by a pure-bred Shorthorn bull, made a profit of \$28; another daughter, sired by a dairy bull, made an annual profit of \$48.

Is it any wonder that Uncle Sam has entered the "bull fighting ring" and has adopted the slogan, "Kill the Grade Bull?"

Before we can manage the dairy, we must have one to manage. As land becomes higher in price, many farmers are forced to give up the beef cattle and adopt the dairy cow. The dairy cow is adapted to intensive farmers, while beef cattle is adapted to excess farming, unless a man is going into the breeding business.

We would recommend that a man start in with a herd of good local cows. These animals should be well selected by some one who knows a dairy animal, and by using a pure-bred bull that comes from good stock a man can in a few years have a herd of high-producing



Part of Holstein Dairy Herd, West Tennessee Experiment Station, Madison County. This county was formerly in quarantine on account of Texas Fever Ticks.

animals. Pure blood is instilled into a herd very fast. In six generations we can have more than 98 per cent pure blood, even though we start with scrubs. Say we have a herd of ten or twelve cows—this is about the right number for one man to care for. The dairy barn should be separated from the other buildings, and need not be expensive, but a building having an abundance of light and good ventilation, also having a concrete floor. No dairy is complete without a silo.

Regularity in milking, feeding and watering should be practiced. The milkers should keep their cows clean; milk quickly and quietly, using sanitary pails. The milk should be weighed daily, or at least one day each week.

We heard complaints about the price of milk. I think that milk should be graded and either more money paid for good, clean milk, or else less money for poor milk. The milk should be cooled as soon as possible, as cold retards bacterial growth and increases the keeping qualities.

Next to poor cows, the poor feeding methods that some people follow are responsible for many farmers losing money, aside from cottonseed meal. All dairy feed should be produced on the farm. Practically all grain grown on the farm should be fed there, thus keeping up the soil fertility.

Many of our farmers do not realize that when they sell a ton of



A Herd of Fine Jerseys.

corn they are selling about \$9 worth of fertility, nor do they seem to realize that when they feed a ton of cottonseed meal they have left about \$22 worth of fertility.

Until about forty years ago Wisconsin was a wheat State. Many of the farms got so poor that they would not raise a mortgage, but extensive wheat culture was abandoned and dairy cows adopted. These Wisconsin farmers and dairymen are now using millions of dollars worth of cottonseed meal and are selling into the South annually millions of dollars worth of butter, cheese and canned milk. Their farms are growing richer. I wish I could say the same of the average Southern farm.

How should we feed? We should feed according to production. It is not uncommon to find a stable of ten cows where no two cows should be fed alike. In that stable it is entirely possible that five cows

are overfed. I mean by feeding for production every cow should be fed according to her ability to produce milk, using a grain ration of one pound of grain for each three pounds of milk produced per day. A good grain ration is equal parts of cottonseed meal, corn and cob meal and barley; or a ration may be used that is home grown by using soy bean meal, corn and cob meal and barley.

A ton of alfalfa is equal to a ton of bran, so we cannot afford to buy bran. An acre of alfalfa has a feeding value of about four acres of timothy, so we cannot afford to feed timothy hay to dairy cows, but feed alfalfa, clovers, beans and peas as these crops all add nitrogen to the soil; besides they fit in nicely with the crop rotation.

As previously stated, a dairyman cannot afford to be without a silo and pasture. Later, as the lands become higher in price, the soiling crop system will be used. An acre of corn silage will produce as much rough feed as three acres of grass will produce.

How to feed the herd on increase in production. This is done by discarding all diseased animals, also the poor ones, and raising the best heifer calves. Every farm should annually raise the best calves, as these can be economically developed on skimmed milk, a little grass and good pasture, and very soon grow into money. There is no farm work as interesting as caring for young stock. The calf of today is the cow of tomorrow. The dairy farm of last year is a rich farm this year. The farmers who are keeping live stock are planning well for their prosperity.

FOR THE SWINE BREEDER.

Insanitary conditions about the hog pens cause an unwarranted loss of pigs in infancy.

Corn breeders claim that it is possible to double their crops by improved methods. Is it not possible for us to double our pig crop without keeping more sows?

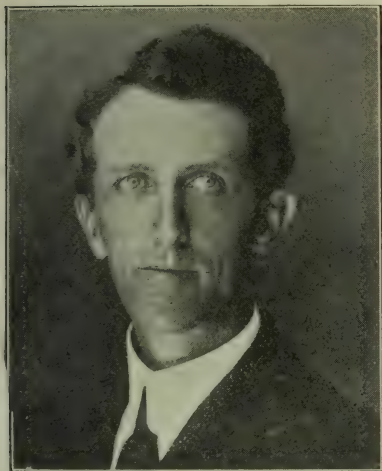
The size of the pig crop depends upon the care and feed given the sows more than it does upon how many sows we keep. The fewer sows we keep the better are the chances of saving a large number of pigs per sow.

Overfeeding and underexercising will ruin the best of brood sows. sows.

When outdoor exercise and sunshine are lacking, the pigs should have a wide variety of feeds.

CALVES AND HOGS AS A DAIRY BY-PRODUCT.

CHAS. J. BEAL, ROGERSVILLE, BEFORE EAST TENNESSEE FARMERS' CONVENTION AND INSTITUTE.



In taking up the discussion of this subject, I wish to say in the outset that I am one of the least among you and I fully realize that I am only on the threshold of a knowledge of this very important subject of the dairy and its by-products.

My own knowledge experimentally is limited and I use liberally the experiences and teachings of others far abler than I. I consider the business of handling scientifically the products from the cow the most important and far-reaching of all the lines along which we as farmers may work. About \$80,000,000 are rolling away from the South every year to bring in the butter we use. This does not include cheese and canned milk.

Those millions must remain at home. We of the South must turn to the old cow. The exhausted soils and red gullies tell the story plainly. We are struggling futilely. The fertilizer man, the Northern dairy man, the money lender, and the tax collector get us every year, and we are like the drunken man who paddled steadily at his oars all night and when morning dawned found he had forgotten to untie his boat from the bank of the stream. So we as farmers struggle steadily, but it is a weary struggle. A laborer is worthy of his hire, but sometimes we do not earn wages. So we leave the farm and its drudgery for the city, thus joining the world of consumers.

However, we are awakening, the dawn is breaking, the anchor will be lifted, we are pushing into the torrent of progressive, modern methods. We hope this torrent will flood every Southern State and draw out and wash away all the foggy ideas that are ruining us. We realize that the levees of prejudice and ignorance are pretty strong, but they are breaking away.

It has been said that a ton of wheat worth \$35 removes \$9.50 worth of soil fertility, whereas one ton of butter worth \$600 removes only sixty-four cents worth of soil fertility. That is pretty plain and

easily understood. In other words, if we continue to haul our soil fertility away in wheat and corn and cotton our condition cannot improve.

There are three ways of managing your dairy: First, you can sell your whole milk direct to the consumer; second, you can sell your cream or butter fat; and, third, you can manufacture butter. In considering calves and hogs as dairy by-products we are forced to use one of the two last mentioned methods, and we very much favor the manufacture of the finished article of butter as being in our opinion the most economical and profitable way.

As I have already stated, one ton of butter, worth \$600, removes from the soil only sixty-four cents worth of soil fertility. That is good enough. Therefore, it is evident that the skimmilk and butter-milk contain most of the soil elements and we are going to keep it on the farm and return it to the land through calves and hogs.

The little calf should have its mother's milk for the first two weeks and should be allowed to suck only four to six days. At the end of the second week we may substitute one-fourth skimmilk, heated to blood heat. This gradual substitution may continue until in his sixth week he may be a full-fledged skimmilk calf. A little oil meal may be added gradually as the whole milk decreases and soon he will eat the dry feed. If at any time his digestive organs become deranged a lighter feed of whole milk for a few days will usually set him right and further as a preventive of this dreaded condition.

Keep feeding places and quarters perfectly clean. Give them a plenty of nice clean water in addition to milk. Feed regularly and sparingly rather than too much. At this age it is well to train your future dairy herd to the halter and to gentleness.

A bunch of such calves is a kind of property some farmers overlook when they get to complaining about hard times and their inability to get ahead. Be good to the calves, for they are great economical butter makers.

The result from feeding skimmilk to stock calves and veal calves has not been so uniformly profitable. The most profitable skimmilk calf is the dairy heifer calf. Next in order comes the veal calf and last the stock calves of the beef breeds.

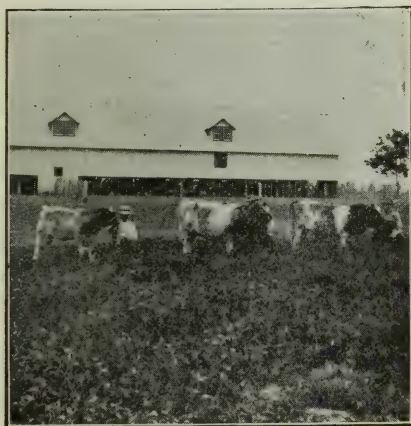
On reliable information we are shown by actual calculation that veal calves fed whole milk have made a net return of forty-one cents for butter fat or \$1.44 per hundred for 3 per cent milk. It appears from the above that considering the actual labor involved we are doing a good business when we give good care to the feeding of calves

as products of the dairy. We prefer our skimmilk calves to be Jersey heifers for the greatest profit, but at present prices for high-class calves, reaching as much as \$100 at weaning time, we can afford to give them considerable milk, but from the standpoint of the ordinary farm dairyman with grade cows and a high-class bull we are emphatic in declaring that the facts bear us out in the statement that calves of any breed or sex are an important and profitable by-product of the dairy herd in the South or anywhere else.

In regard to hogs as a by-product of the dairy, I have argued for butter-making and the calf as a by-product and if I have proven my case and it appears to you well grounded on facts, the question then confronts us, What shall we do with the skimmilk after the calf is



**Prize Winning Yearling Heifer,
Lespedeza Farm, Hickory
Valley, Tenn.**



**Junior Calves, Lespedeza Farm,
Hickory Valley, Tenn.**

weaned to dry feed, and what shall we do with the buttermilk all of the time? I answer, hogs. Using skimmilk in conjunction with corn is the very cheapest way of manufacturing pork. If we had enough milk in the South with our wonderful hog climate we could very materially lessen the high cost of living.

The first hundred pounds of hog costs less than any succeeding hundred that we put on him. Nine parts of skimmilk to one part of corn will put such a value in the skimmilk that this, taken in conjunction with the butter fat, gives a greater return than is possible from the sale of whole milk, while the estimated value of excreta from every 1,000 pounds of hog is \$30 in available plant food. Therefore, it appears that in the sale of the finished article of butter, in the growing of calves and hogs as dairy by-products, we have reached

the apex of the very most progressive and modern way of coining money on Southern farms with a minimum loss of soil fertility.

I challenge any man of the farm to show where we as farmers can realize so much in actual profits along any line as along the way of the old cow, that so calmly makes her contented way beside the still waters or browses happily in the green pastures or ruminates beneath the shade of the evergreen foliage of the South.

Instead of sending away the millions of dollars to other markets the money that should belong to our children, let us with modern, intelligent grasp of conditions realize that in the verdant South, the



Grade Hereford Steer.



**A Good Line of Bulls,
Lespedeza Farm.**

sunny, smiling South, where the growing season never ends, where outdoor life and health may be the portion of our beautiful and gentle kine, where we may feed more economically and graze more economically than anywhere on earth and at the same time that we save our millions for the South we have bequeathed to the future great empire a fertility in soil texture and elements far superior and far exceeding our fondest dreams.

The great new South of which I dream is a South luxuriant and verdant, peopled with an intelligent, happy and prosperous people.

Years of experience and close observation, together with a carefully kept account of all feed, etc., have demonstrated that there is no more profitable animal on the farm than the hog, and no variety of farm stock that will so quickly lift a man from dependence to independence when properly fed and cared for.

WHAT IS THE BEST METHOD OF GETTING HOME- MAKING IN THE PUBLIC SCHOOLS AND RURAL COMMUNITIES.

MISS MARIE WILLOUGHBY, UNITED STATES DEPARTMENT OF AGRICULTURE, BEFORE EAST TENNESSEE FARMERS' CONVENTION AND INSTITUTE AT KNOXVILLE.



It gives me great pleasure to be with you upon this occasion, when we find gathered together men and women who are directing their best efforts and energies toward bringing about better conditions of living in the country. The feature which must inevitably strike a lecturer addressing this convention is the notable proportion of women present, and the interest which they evince in the problems of farm life and farm management, questions whose bearing on themselves the

farm women are just beginning to appreciate. But a few years ago a meeting called a farmers' convention and institute would have been attended by and composed of only the male population, whereas today there are almost as many women in attendance as men. This present promise of intelligent cooperation on the part of the women is a most encouraging sign to those interested in agricultural work, and there is no question as to the importance of the results which this cooperation will bring about.

Farmers—the men alone—long ago learned the advantages of organization and mutual aid. Meetings “for men only” have been in existence since the first little agricultural society was formed in the State of South Carolina in 1784, for it has had its counterpart in every section of our country. These men had a definite purpose in organizing, a purpose designed to bring about some particular object as the different needs of the several sections demanded. By 1860 nearly every State had its agricultural society, and perhaps nothing more clearly signifies the success of such organizations than does the marvelous agricultural development of the past sixty years. Such organizations and societies have been the direct means of bringing about scientific agriculture, which increases yields, shortens hours of labor,

lessens work and gives larger possibilities for intellectual advance. The methods adopted through these organizations have made it possible within the last sixty years to reduce the actual amount of labor required for producing a bushel of wheat from over three hours to ten minutes; the four and one-half hours of labor required to produce a bushel of corn to forty-one minutes, and the thirty-five and one-half hours of labor necessary to the production of a ton of hay to eleven and one-half hours. Thus methods of farming have been so revolutionized that today the average farmer at fifty years of age has made money enough to leave the country and move to the city, where he can enjoy the privileges not only of the modern conveniences, but of social intercourse with his fellowman. These statistics and many others that are quite as convincing indicate that these organizations have been eminently successful in their efforts to make farming a profitable business.

On the other hand, statistics show that the farmer's wife has not fared so well. To every man who dies on the farm there are two deaths among the women, for absolutely nothing is done to give them the aid they need in housekeeping, in the bringing up of the children and in the performance of their share of the farm duties. It is evident, therefore, that this two-to-one death rate among our farming men and women leaves the man alone in every second case to move to town to enjoy the advantages which his scientific farming and use of labor-saving devices have made possible, while his wife, unaided in her struggle on the farm, has succumbed to hardships that might at least have been lessened.

To this too long neglected condition of the farm home can be attributed directly the sources of discontent which now exist in connection with country life. With the advance of civilization have come increased wants and the demand for their satisfaction. The towns and cities represent the satisfaction of these wants, and there is no reason to regard the farmer and his family as human beings different from those of the cities. From the result of surveys made by means of questionnaires in different sections of the country the cause for the "drift to the city" movement may be classified under two headings, namely, lack of modern improvements and conveniences, and, secondly, social dissatisfaction and isolation. Woman has always been looked upon as the great social factor, and this isolation in the rural districts is caused directly by the absence of labor-saving devices and by lack of knowledge of home management, involving as it does unnecessary labor and enormous waste of time. As long as the woman is con-

fined to the narrow limits of the kitchen and home circle by reason of drudgery the social side of farm life cannot be adequately developed. In order that she may have time to break down the barriers of isolation, to develop new interests and to contribute to the social uplifting of the community, science and invention must be brought to her aid to lighten the drudgery in her household. The two prevalent objections to farm life, therefore, resolve themselves into one, namely, lack of scientific attention to home management.

Demand for such action is being recognized by the nation, and much agitation and good work are being done in the way of women sections of farmers' clubs and institutes, where woman's distinct sphere, function and needs have attained recognition. Many eminent sociologists have made a special study of the subject, and the results of their research can be obtained in books, magazine articles and in the bulletins issued by the Department of Agriculture. Thus, for example, it has been worked out by a student of economics in New York City that a minimum income of from \$900 to \$1,000 is the money limit for decency. Government statistics show that 80 per cent of the population of the United States have an average income of only \$600 dollars. It is therefore necessary to increase the efficiency of this 80 per cent so they can make the very best of what they have at hand. The need for immediate action has become so urgent that after consultations of proper authorities the great Department of Agriculture may deem it wise to include a section devoted to home betterment in the new Bureau of Rural Organization in the Department of Agriculture. This is but adding to the work now being done along this line by the department..

Since we have the scientific ideas on which home making and home management should be based, as well as many inventions at hand to aid in the accomplishment of such plans, it but remains to find a means of putting this scientific information into common use. People living in the country must be taught the facts and their significance; must be given an ideal to attain, and must be educated to their needs. Hence, the question under discussion today is: "What Is the Best Method of Getting Home Making in the Public Schools and Rural Communities?"

When we have exemplified before us on every hand what has been accomplished by means of clubs of one kind and another it is not strange that we should suggest club work as probably one of the most satisfactory solutions of this problem. By taking this means of dissemination existing organizations can be brought into immediate use.

For example, a very effectual means of introducing home making in your own State would be through the corn, tomato and potato clubs, all of which are working, although it may be unconsciously, toward this end. No more forcible illustration could be adduced of the value of club work and the way in which general interest in home life is not only conserved but actually vitalized than by recounting briefly the actual stories of some of the members of the Girls' Garden and Canning Clubs. For example, Myrtie Hardin, of Benton County, Tennessee, made a notable record in her home garden, canning and domestic science work last year. In the first place she enrolled as a member of the National Club, and followed the instructions received from the Department of Agriculture and the State Agent in charge of the club work, Miss Virginia P. Moore of Nashville, absorbing all the information, help and inspiration given her by County Superintendent and other local leaders in the growing of the one-tenth acre of tomatoes. She did all the work from the cold frame to the canner, canning sixty-six varieties of tomato products and making a net profit from her plat of over \$100. Furthermore, she worked out 126 tomato recipes and compiled them in a nicely designed and illustrated booklet, and also wrote out the life history of the tomato in connection with her school work and club plat experiences. Another booklet prepared by her contained a set of arithmetic problems dealing with the raising of tomatoes, and these are stated and solved in a third booklet. The story of "How I Made My Crop of Tomatoes" forms a fourth booklet, making in all four well-written and nicely illustrated essays. The premiums that Miss Hardin won are also characteristic of the value and influence of this club work as affecting home life. She won a free trip to Columbia, S. C., on the occasion of the National Corn Show. At the State Fair at Nashville she won a thoroughbred Jersey calf, a pair of Indian Runner ducks, a fireless cooker, a cutglass bowl and hand-embroidered doilies, besides several cash premiums.

A similar record of achievement could be told of a number of other Tennessee girls. For example, Miss Sylvia Richmond and Miss Nell Griswell. Miss Sylvia Richmond, of Soddy, put up altogether 1,174 cans of tomatoes, beans and other vegetables. She did not raise all these herself, but did all the work of canning. The cost of the cans and other equipment, fruits and vegetables used, outfit, etc., amounted to \$37.72, leaving a profit of \$76.68 valuing the product at ten cents a can.

Another girl, with no land to tend, started her tomato patch in a

churchyard, which lay beside the school house, and the trustees wisely decided to let her have the ground.

At the Middle Tennessee Farmers' Institute there was another little girl and her still smaller sister, not yet old enough to join the club. These children had never ridden on a train until they took the trip which the elder had won by her proficiency in the work.

Again, the daughters of Mr. D. W. Duncan, of Tasso, Tenn., became interested in the Tomato Club work last spring, and wished the tenant girls on the farm to join. They said they had no land, so Mr. Duncan gave each of them the needed tenth of an acre. Before this time the tenant farmers, like too many others, had been doing very little or nothing at all along this line, evidently thinking that it was beyond their ability. The example set by Mr. Duncan could be followed by hundreds of other land owners in the South to their profit as well as to that of their tenants.

The average profit made on the one-tenth acre by all the girls reporting from twelve States last year was \$21.98. This is at the rate of \$219.80 per acre; although, as I have just described, there are some instances in which the net profit has amounted to more than \$1,000 per acre.

Now, the most encouraging thing about this work is not so much the improvement of the garden, the profit on investment or the exercise of out-of-doors, but rather the fact that all of this in a very effectual way influences the girl's life for higher efficiency and greater contentment in the rural home life. (All of the girls are required not only to can their surplus tomatoes, but to work out in useful recipes for home use much of their products.) The girl who knows how to raise vegetables and to can them is a valuable member of any family; and when she also learns how to keep exact accounts of her work and to figure out expenses and profits she is capable of teaching a great many older folks who were never taught to apply arithmetic to their daily work. Thus one little girl in West Virginia last year, who made a net profit of \$70.80, has taught the entire community the value of a little labor-saving device (a home cannery), which will mean much in the elimination of drudgery as well as in the increase of comforts. As the direct result of this girl's effort this single community has twice as much garden area this year, and it is estimated by the local leader that the output per acre will be at least 40 per cent greater than ever in the community.

The Girls' Home Garden and Canning Club work has only been in existence for the past three years, yet we have reports that seventeen

of the girls are attending college, most of them taking domestic science subjects, and that they are paying their way by the use of the money which they themselves have earned in their club endeavors. One girl in South Carolina is spending four years in college with all expenses paid as a result of club efforts. Space does not permit of my enumerating hundreds of instances where these girls have purchased fireless cookers, canning outfits, sewing machines, improved kitchen and home furniture and numerous labor-saving kitchen utensils from money earned in connection with club work. One little girl last year earned enough to send her crippled mother to a hospital where she was operated upon and restored to normal health.

In Geauga County, Ohio, through the efforts of Mrs. J. K. Turner, of Cleveland, Ohio, wife of the editor of the "Mediator," a Girls' Garden and Canning Club has been organized in cooperation with the Department of Agriculture. A new feature of the work has been added here, namely, the "mother-daughter" idea. Wherever a girl has been enrolled as a member of the club the mother is also enrolled as her partner. A mother-daughter combination is thus made, each partner growing, canning and marketing and planning all of their work together. Prizes and premiums are to be awarded to the teams, and the mother and daughter who make the best record in the growing of tomatoes and canning of surplus products are to be given a free trip to Washington. Each of them must have one-tenth of an acre and must follow the government instructions. It is easy to understand the interest of such a combination, not only upon the mother and daughter constituting the team, but upon the entire home and family.

Here are a few achievements in the girls' club work of the past year, which may be of interest, coming as it does from the records submitted from twelve Southern States:

Name and State	Pounds of Fresh Tomatoes	No. and Size of Cans
Arie Hovater—Alabama	3,347	1,530 No. 3's
Gola Hope Braden—Arkansas	1,258	575 No. 3's
Ada Huggins—Florida	2,187	1,000 No. 3's
Ruby Kennedy—Georgia	1,402	1,122 No. 2's
Haydee Briley—Louisiana	2,761	1,262 No. 3's
Nannie Chatham—Mississippi	2,315	1,852 No. 2's
Alma Parker—North Carolina	2,599	1,188 No. 3's
Anice Thompson—Oklahoma	538	243 No. 3's
Little May Du Boise—South Carolina.	4,476	2,046 No. 3's
Sylvia Richmond—Tennessee	2,568	1,174 No. 3's
Annie Wolf—Texas	1,200	960 No. 2's
Bessie Starkey—Virginia	5,928	2,710 No. 3's

It is evident from the foregoing that these clubs are a splendid

success. Instead, therefore, of forming new organizations of home making clubs, enlist the boys and girls of the Corn, Tomato and Potato Clubs. After they prepare the story of "How I Raised My Crop," have them prepare one on "How Raising My Crop Makes Me Better Fitted for Home Management." It would be of great value to have a well-organized office system in the Department of Agriculture to handle this particular subject, follow it up, and see that people who need improving get it. Furthermore, they should have some opportunity to see the demonstration of this important work in the average household, for in general object lessons are necessary to drive the truth home, and educational efforts of an intense kind will be required to induce country people to adopt the advanced modes of living. More bulletins are needed specifically to direct home management, just as the system is carried on in farm management.

Many such bulletins and leaflets relating to cooking, preserving, jelly making and the care of food in the home have been published as a result of the nutrition investigations carried on for twenty years or more in the Office of Experiment Stations in the Department of Agriculture. Such work can be profitably extended. This work is an experimental study of the use in the home of agricultural products, which is to be compared with the much more extensive studies of crop production and other agricultural work, and the department has freely given of its results to the people of the country by means of its publications and its demonstration work and in other ways. Closely connected with the Department of Agriculture are the agricultural colleges and experiment stations for whose establishment and maintenance in each State generous funds are provided by the National Government. The agricultural colleges teach farming and all that pertains to it in perhaps every State. Less generally they provide for the farm girl as well as for the farm boy by offering courses in home economics. So far the experiment stations have devoted their attention to the farm problems and their work has been almost exclusively for the man. To round out the system and give the woman her just due the experiment stations should be provided with funds which would enable them to study the housekeeper's problems as well and add to the fund of information which the housekeeper and teacher can use. The experiment stations should show their methods to all who come and maintain an exhibit which would show the results which they have achieved. This should supplement the similar exhibits of the agricultural colleges which should include a model home with a properly planned and equipped kitchen, and in general all that can be brought

together to instruct the housekeeper in the possibilities of her profession—for home making is a profession. Such model homes, or “practice homes” as they are called, can be found at the agricultural colleges or other schools—for instance, at Winthrop College, South Carolina. Many other kinds of schools and colleges and many other agencies are collecting information on home problems and all this information should be obtainable that will increase the efficiency in the art of home making to the end that the kitchen may be made as attractive and also as lucrative to the girl as the city office or store. Prof. Carver says: “The problem of the manager must always be that of reducing the number of motions to a minimum and of saving every minute of time possible in the performance of any operation.” If anywhere in the world this principle should be applied to the kitchen. The location of the pantry, shelves, icebox, as well as the height and location of the sink, stove and tables, should be arranged with this end in view. There should be on exhibition and in operation in this model house those devices that make possible the conservation of the energy and strength of the woman on the farm. The following is a partial list of such devices: The gas or oil stove, fireless cooker, canning outfit, washing machine, wringer, vacuum cleaner, an electric or gasoline iron, cream separator, churn, universal bread mixer, meat grinder, as well as numerous smaller conveniences. Power of one kind or another is now employed on many farms, and it should be demonstrated at how little cost many of these devices can be operated by such power. It will then appeal to everyone that when housekeeping is based on scientific principles and girls and women are trained for the business, drudgery is eliminated, and that the satisfaction that comes from duty well and intelligently performed will be the result in home making as well as in the professional and commercial spheres of life. It is always and everywhere true that “in order to enjoy labor, one must be fitted for it, not do too much of it, and have a sense of success in it.”

As in other lines, the results of experiment station work should be carried to the home as well as to the farm by the teachers at the agricultural college and by the workers in the experiment stations. In many States this is already done, the home economics department of the college sending out its workers to the farm home as they do to the farm. The farm woman should have her chance and the Department of Agriculture, the agricultural college, and the agricultural experiment station should do for the home, in town or country, what it is now doing for the farm and should do it as freely and as fully.

Special lecturers and demonstrators should be sent to give instructions at institutes and at other gatherings. A special section devoted to home making should be added to the work already being done by the agricultural cars that are sent from the experiment stations. As a reward for certain achievements of the girls of the clubs a few weeks special training might be offered at the experiment station, to a girl from each school, who might then return to carry on demonstration work at her own school club meetings. This would encourage community leadership, a feature which is of vital importance in the betterment of rural conditions.

The work of home making must not be left to the school clubs alone. It is essentially a subject of education by which succeeding generations will profit, but we must not neglect the present generation. The most primitive and isolated farm home has a woman in it today who is struggling with the hardest problems that confront the human race—poverty, isolation and loneliness. This woman needs immediate help and encouragement, not for charity's sake, but from the standpoint of social justice. She needs to know something about scientific cleanliness, the prevention of disease and general home management. The get-together spirit can best be encouraged by the organization of women's clubs for home making. When neighborhood clubs already exist the introduction of the study of home management is a simple matter, and, in case there is no club in the community, one should be organized. A "mother-daughter" club, as described above, has been successfully started in some sections of the Middle West. Where the societies do not bear this name, it is advisable to have joint meetings of the women's organization with the school clubs. Aside from the general information derived, the friendly intercourse resulting from this meeting between mother and daughter in a common cause is invaluable.

In closing I may say that I have endeavored in this address to anticipate my subject and to drive home the crying need for the application of scientific principles to home management on the farm. Certainly there is no way of retaining our farm population except by devising such improvements for the home as will admit of a decent standard of living and thereby allow some time and energy for social intercourse. What is more to the point at the present time (for these improvements do exist and are available) is the question of disseminating this knowledge and of educating our people to their needs.

This, as I have stated before, can best be done by introducing a new home management phase in the existing school clubs, which have

already proven their value for the immediate purposes which led to their formation; and, secondly, by adding this work to that already performed by the National Department of Agriculture, our experiment stations and agricultural colleges and by demonstration trains and all other agencies.

There are many homes which are now well managed and well administered, where the housekeeper has learned from her mother or from her own experience good methods for solving her problems. We should take advantage of these facts also and gather the results of her experience for the benefit of other housekeepers, for we must not forget that knowledge gained by experience and knowledge gained in the laboratory are equally useful and that the two should go hand in hand, each supplementing the other.

The movement toward the betterment of the farm home is well under way and no opportunity to further it must be neglected.

TENNESSEE VETERINARIANS.

Practitioners Licensed by State Board of Veterinary Medical Examiners to August 1, 1913.

Certificate No.	Name	Graduate.	P. O. Address.
1	Geo. R. White.....	Columbian University.....	Nashville.
2	Frank B. Moore.....	Existing Practitioner.....	Nashville.
*3	Joseph Plaskett....	McGill University.....	Nashville.
*4	Lewis P. Ashley....	Existing Practitioner.....	Memphis.
*5	C. W. Wattam.....	Existing Practitioner.....	Memphis.
6	John Bell.....	Kansas City Vet. College....	Nashville.
7	W. M. Bell.....	Kansas City Vet. College....	Nashville.
8	L. T. Lewis.....	Existing Practitioner.....	Gallatin
9	H. H. Edwards.....	Existing Practitioner.....	Lewisburg.
10	A. O. Kennedy.....	Existing Practitioner.....	Columbia.
11	G. B. Giltner.....	White's School of Michigan..	Murfreesboro.
12	Geo. B. Blackman..	American Vet. College.....	Nashville.
13	F. W. Morgan.....	McKillip Veterinary College..	Chattanooga.
14	W. P. Watkins.....	Existing Practitioner.....	Memphis.
15	R. E. Collins.....	Ontario Veterinary College..	Memphis.
16	J. W. Scheibler....	American Vet. College.....	Memphis.
17	C. C. Brown.....	Chicago Veterinary College..	Memphis.
*18	W. S. Gony.....	Existing Practitioner.....	Memphis.
19	W. G. Shaw.....	University of Pennsylvania..	Knoxville.
20	M. Jacob.....	University of Pennsylvania..	Knoxville.
21	Chas. E. Campbell..	Existing Practitioner.....	Lenoir City.
22	W. J. Strayer.....	Existing Practitioner.....	Memphis.
23	J. B. Edwards.....	Existing Practitioner.....	Fayetteville.
24	J. B. L. Terrell....	Existing Practitioner.....	Dresden.
25	O. L. McMahon....	McKillip Veterinary College..	Columbia.
26	J. W. Hall.....	Existing Practitioner.....	Smyrna.
27	J. G. Robertson....	Existing Practitioner.....	Triune.
28	W. L. Coplin.....	Existing Practitioner.....	Jackson.
29	S. W. Reed.....	Ontario Veterinary College..	Cleveland.
30	J. L. Chilton.....	Existing Practitioner.....	Gunter.
31	H. P. Webster.....	Existing Practitioner.....	Mt. Pleasant.
32	H. H. Mayberry....	Existing Practitioner.....	Nashville.

STATE VETERINARIANS—Continued.

Certificate No.	Name	Graduate.	P. O. Address.
33	N. Sharp.....	Existing Practitioner.....	Friendship.
34	Early Plew.....	Existing Practitioner.....	Paris.
35	J. G. Cook.....	Existing Practitioner.....	Nashville.
36	W. H. Murray.....	Existing Practitioner.....	Memphis.
37	H. D. McCrory.....	Existing Practitioner.....	Ostella.
38	C. D. McCrory.....	Existing Practitioner.....	Petersburg.
39	C. B. Banks.....	Existing Practitioner.....	Memphis.
40	M. P. Mattice.....	Existing Practitioner.....	Memphis.
41	John P. Rauch.....	American Vet. College.....	Memphis.
42	J. M. Jordan.....	Existing Practitioner.....	Fayetteville.
43	Jesse C. Brown....	Chicago Veterinary College..	Nashville.
44	Eldridge N. Brown..	Chicago Veterinary College..	Nashville.
45	R. G. Collins.....	Existing Practitioner.....	Nashville.
46	J. Mangram.....	Existing Practitioner.....	Smithville.
47	W. B. Prater.....	Existing Practitioner.....	Dayton.
48	W. M. Rader.....	Existing Practitioner.....	Bull's Gap.
49	George Masgana....	Alfortville Vet. College.....	Chattanooga.
50	A. C. Topmiller....	McKillip Veterinary College..	Murfreesboro.
51	J. H. McMahon.....	Ontario Veterinary College..	Columbia.
52	D. B. Morgan.....	McKillip Veterinary College..	Fayetteville, Ark.
53	S. G. Thomas.....	Existing Practitioner.....	Bluff City.
54	J. L. Topmiller....	McKillip Veterinary College..	Bowling Green, Ky.
55	G. A. Metcalf.....	U. S. Veterinary College....	Knoxville.
*56	W. L. Gates.....	Ontario Veterinary College..	Memphis.
57	A. T. Leach†.....	McKillip Veterinary College..	Somerville.
*58	C. L. Lumby.....	McKillip Veterinary College..	Chattanooga.
59	F. R. Youree.....	McKillip Veterinary College..	Lebanon.
60	J. C. Gill.....	McKillip Veterinary College..	Clarksville.
61	D. W. Hughes.....	University of Pennsylvania..	Knoxville.
*62	L. H. Adams.....	University of Pennsylvania..	Knoxville.
63	C. H. Wright.....	Ontario Veterinary College..	Jackson.
64	A. E. Robertson....	McKillip Veterinary College..	Nashville.
65	H. N. Holmes.....	Ontario Veterinary College..	Bedford City, Va.
66	W. M. Giles.....	McKillip Veterinary College..	Franklin.
67	C. C. Hunt.....	Indiana Veterinary College...	Memphis.
*68	Frank Hecker.....	Chicago Veterinary College..	Camden.
*69	Chas. J. Becker....	Cincinnati Vet. College.....	Bolivar.
*70	Hobart C. Ayer....	Ohio Vet. Col., Cin. Vet. Col..	Memphis.
*71	Jos. R. Welsh.....	Indiana Veterinary College..	Memphis.
72	Tom Talbott.....	McKillip Veterinary College..	Mt. Pleasant.
73	H. E. McCalla.....	Chicago Veterinary College..	Jackson.
74	James M. Jehle....	Chicago Veterinary College..	Chattanooga.
*75	C. F. Hobbs.....	Chicago Veterinary College..	Jackson.
76	Victor J. Andre....	Ontario Veterinary College..	Osceola, Ark.
*77	D. J. Meador.....	Cornell University.....	Selma, Ala.
78	Luther O. Lamb.....	Existing Practitioner.....	Dyersburg.
79	John W. Joyner....	Existing Practitioner.....	Covington.
80	A. W. Waldron, Jr..	Existing Practitioner.....	Tullahoma.
*81	J. L. Smith.....	Existing Practitioner.....	Dresden, R. D. No. 2.
82	Jas. C. Connell....	Existing Practitioner.....	Martin, R. D. No. 5.
83	Albert J. Brown....	Ontario Veterinary College..	Fayetteville.
84	M. P. Hodson.....	Existing Practitioner.....	Maryville.
85	C. V. Myers.....	Existing Practitioner.....	Greeneville.
86	Walter Morris....	Existing Practitioner.....	Somerville.
87	Arthur J. Bell.....	Existing Practitioner.....	Pulaski.
88	W. M. Thompson....	Existing Practitioner.....	Alamo, R. D. No. 3.
89	M. R. Wilson.....	Existing Practitioner.....	Brownsville.
90	E. M. Culley.....	Existing Practitioner.....	Paris.
91	W. W. Lacy.....	Existing Practitioner.....	Shelbyville.
92	J. P. Meador.....	Existing Practitioner.....	Gallatin, R. D. No. 1.
93	Ira Glasson.....	Existing Practitioner.....	Union City.
94	Robert A. Kite....	Existing Practitioner.....	Baileyton.

STATE VETERINARIANS—Continued.

Certificate No.	Name	Graduate.	P. O. Address.
101	A. B. Luttrell.....	Existing Practitioner.....	Glen Alice.
102	W. C. Reams.....	Existing Practitioner.....	Bells.
103	Robt. L. Rose.....	Existing Practitioner.....	Springfield.
104	Frank Duncan.....	Existing Practitioner.....	Indian Mound.
105	T. B. Ridgeway.....	Existing Practitioner.....	Kenton.
106	S. W. Davis.....	Existing Practitioner.....	Shelbyville.
107	G. P. Whittington..	Existing Practitioner.....	Morristown.
108	R. H. Gunter.....	Existing Practitioner.....	Chattanooga.
109	J. M. Carter.....	Existing Practitioner.....	Milton, R. D. No. 2.
110	J. L. Prater.....	Existing Practitioner.....	Maryville.
111	D. A. Walker.....	Existing Practitioner.....	Friendship.
112	J. E. Spillman.....	Existing Practitioner.....	Beech Grove.
113	M. H. McLean.....	Existing Practitioner.....	McKenzie.
114	J. W. Hibdon.....	Existing Practitioner.....	Chattanooga.
115	J. L. Hall.....	Existing Practitioner.....	Eagleville.
116	Wm. Murry.....	Chicago Veterinary College..	Covington.
117	B. F. Mosley.....	Existing Practitioner.....	Dresden, R. D. No. 4.
118	E. B. Topmiller....	Existing Practitioner.....	Winchester.
119	H. D. McCrary.....	Existing Practitioner.....	Petersburg.
120	I. W. Britt.....	Existing Practitioner.....	Sharon.
121	W. N. Eagle.....	Existing Practitioner.....	Spring City.
122	S. A. Smithson.....	Existing Practitioner.....	Greenfield.
123	John L. Alston.....	Existing Practitioner.....	Henning, R. D. No. 1.
124	S. D. Summers.....	Existing Practitioner.....	Gleason.
125	John S. Lewis.....	Existing Practitioner.....	Gallatin.
127	J. C. Miller.....	Existing Practitioner.....	Ripley.
128	H. A. Prater.....	Existing Practitioner.....	Louisville.
129	John F. Holt.....	Existing Practitioner.....	Pulaski.
130	Frank M. Perry....	Existing Practitioner.....	Greenfield, R. D. 4.
131	Geo. W. Morris....	Existing Practitioner.....	Somerville.
132	D. A. Walker.....	Existing Practitioner.....	Friendship.
133	Jas. T. Pylant.....	Existing Practitioner.....	Mulberry.
134	W. C. Hall.....	Existing Practitioner.....	Smvrna.
135	John R. Weems.....	Existing Practitioner.....	Baileyton.
136	H. F. Wray.....	Existing Practitioner.....	Brownsville.
*137	N. E. Morris.....	Existing Practitioner.....	Franklin.
138	J. J. Gregory.....	Existing Practitioner.....	Humboldt.
139	J. C. Jackson.....	Existing Practitioner.....	Shelbyville.
140	Geo. H. Allen.....	Kansas City Vet. College...	Union City.
*141	A. I. Jones.....	U. S. College Vet. Surgeons..	Morristown.
*142	J. S. Audrade.....	McKillip Veterinary College..	Chattanooga.
144	H. R. Shaefer.....	Chicago Veterinary College..	Memphis.
145	R. H. Smith.....	Indiana Veterinary College...	Sweetwater.
146	J. M. Jones.....	McKillip Veterinary College..	Lewisburg.
147	A. C. Misner.....	Terre Haute Vet. College...	Union City.
148	L. D. Whitaker....	U. S. College Vet. Surgeons..	Nashville.
149	P. J. Landes.....	U. S. College Vet. Surgeons..	Nashville.
150	B. F. Morey.....	Terre Haute Vet. College...	Martin.
151	H. H. Adair.....	U. S. College Vet. Surgeons..	Bristol.
152	D. E. Haworth....	Indiana Veterinary College...	Halls.
153	S. H. Woods.....	Kansas City Vet. College...	Murfreesboro.
154	P. C. Taylor.....	McKillip Veterinary College..	Shelbyville.
155	Carl Wilson.....	Indiana Veterinary College...	Athens.
156	J. I. Siress.....	Terre Haute Vet. College...	Paris.
157	A. C. Beaden.....	Existing Practitioner.....	Ripley.
158	Charles Ellis.....	Terre Haute Vet. College...	Palmer'sville.
159	J. N. Hunter.....	McKillip Veterinary College..	Woodbury.
160	C. H. Biggs.....	McKillip Veterinary College..	Kingston.
161	R. T. Robertson...	McKillip Veterinary College..	
162	F. W. Allen.....		Bardwell, Ky.

*Removed from State.Indiana Veterinary College... Farmington.

†Deceased.

THE FUTURE OF AGRICULTURE.

There was a time when, in this country, it was the impression of some, perhaps a great many, that if a man was fit for nothing else, he might be a farmer. Of course such a notion was based upon ignorance of what constitutes farming. It was based upon the idea that all a farmer had to do was to clear his land of its timber, plow the soil, only scratch it on the surface maybe, plant, keep down the weeds and grass, and wait for the harvest.

But different impressions prevail now, and they are becoming deeper and deeper as time goes by. It is realized that there is work on the farm for the scholar, more work for him than there is in the law office, and better work so far as substantial results go. The best farmer should be a chemist, qualified to analyze soils, ascertain what element is lacking in this or in that, and to tell how to supply the lacking element so as to improve fertility and increase productive capacity.

This new thought on the subject of agriculture, when it began to emerge from a point where the farm was looked upon as a stage for playing the act of drudgery, and to move up in the ranks with the sciences, came along a little over fifty years ago, when Justin S. Morrill, a United States Senator from the State of Vermont, succeeded in having the National Congress enact a law donating the proceeds of the sale of certain public lands to the States to be used in the establishment of agricultural colleges.

Men, farmers themselves, laughed at the idea of a boy making a better farmer when he became a man, on account of having received a college education. That was when, if a boy was sent to a college to be educated, it was expected that he was going to try to be a lawyer, a doctor, a teacher or a preacher. The idea of educated farmers, specially educated with a view to making of them successful tillers of the soil, took hold slowly and grew slowly. But it has grown, and there are now agricultural colleges in all the States, the classes that are taking lessons in them are larger than ever before, and are growing in numbers and in interest faster than ever before.

Agriculture is a science, a science that relates more closely to the comfort and the very life of the race than any other of the sciences. It is a science that has to do with the production of that from which human food is made and human clothing. There is no other source from which the food that sustains life and the clothing that gives comfort can be had, than from the soil. This has been true in all

ages and in all years ; but the people of our country have never before been so much awake to the fact as they are now.

Consequently the agricultural colleges of the country were never before so popular as they are now. Never before have the owners and the tillers of the soil been so impressed with the conviction that they have not been getting one-half as much from their soil as it is possible for them to have, and to get it without much if any additional outlay of labor. The belief prevails in a good many minds that the tiller of the soil who fails in the course of a few years to double his products per acre has no business with owning lands, and that he who fails to improve and to increase his products may be set down as a cumberer of the ground. His relation to the farming world is very similar to that of the barren fig tree, that withered and died under the curse of the Master, to other fig trees that filled their place in life by bearing fruit.

Pardon us if we make a prediction. There are boys and girls now living who will live long enough to see the time come when a great farmer will be numbered with great scholars, and when his avocation, or it may be and by be called a profession, will stand just as high in the world of practical scholarship, as that of the man who has taken his place in the front rank of others, spoken of as the "learned professions."—*Knoxville Journal and Tribune*.

MATERIALS FOR A YARD OF CONCRETE.

Many times it is puzzling to get at the amounts of cement, sand and gravel to make a piece of concrete. At such times the following rule will furnish the desired information. To find the number of sacks of cement to make a yard of concrete, divide 40 by the number of "parts" in the mixture ; thus for a 1-2-4 mix the number of sacks of cement will be 40 divided by 7 or 5.7. To find cubic feet of sand multiply number of sacks of cement by "parts" of sand or 2×5.7 , or 11.4. Similarly the number of sacks of gravel will be 4×5.7 , or 22.8. If only gravel had been used the method would have been the same. A 1-2 mix would require 13.3 sacks of cement and 26.6 cubic feet of sand for a yard of concrete.—*E. W. Hamilton*.

The secrets of egg production consist of a good supply of grit, good health, plenty of exercise, pure food, green food, fresh water, cut clover hay and green cut bones, freedom from lice, regularity in feeding, cool houses in summer and warm ones in winter, and breeding only from the best laying stock.

JULY CROP REPORT.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., August 1, 1913.**

Crop correspondents in eighty-five of the ninety-six counties of Tennessee made reports to the Department of Agriculture on conditions in the State for the crop month ending July 20, 1913.

Sections suffering from drouth during the first part of the month were somewhat relieved by rains, which were quite general, from the 9th to the 14th. Since that time, however, there has been little rain in the State, and as a result crops were suffering toward the latter part of the month.

As indicated in last month's report, the wheat crop will show an increase in yield over last year's crop of 50 per cent or more.

Cotton made fine progress under the conditions prevailing, and reports from the cotton section of the State show prospects of a fine yield. The condition of the staple in Tennessee is said to be better than in any other section of the cotton belt.

Corn is showing in good condition throughout the State, notwithstanding the great need of rain.

The Irish potato crop for the State will show considerable decrease, the first crop being cut short, and there being little prospect for the second crop.

There will also be a marked decrease in the production of tomatoes in the market gardening sections of the State.

Clover has been damaged by the dry weather, but conditions were favorable for saving the hay crop, which will show an increase over last year.

Peanuts will show an increased yield.

Live stock is not in quite as good condition as at this time last year, partly on account of pastures failing, and the prevalence of hog cholera.

In Obion County, corn is reported in fine condition, with better prospects than last year. Cotton in that county is late, but looks well.

The dry weather has killed young clover in sections of Lauderdale County, but general crop prospects are reported better than for many years.

Tipton County reports timely rains, and all crops are reported in a fine state of cultivation. Both corn and cotton are reported in excellent condition in Shelby County.

In Weakley County crops are reported in fine condition, and the rain on the 11th did a great deal of good. In Crockett County prospects for corn and cotton are reported better than they have been for many years.

In Haywood County early corn suffered for rain, but late corn is in fine condition. The cotton plant is small, but growing and fruiting well. In Hardeman County crop prospects are reported better than for many years, with live stock in fine condition.

In Fayette County corn and cotton are reported better than for many years. The correspondent says a majority of the crops in that county promise a full yield, but that there is always enough poorly-cultivated and badly-managed land to cut down the general average. Rain is reported as badly needed in Henry County.

In Carroll County recent rains have greatly helped clover and tobacco and other crops. In Henderson County corn is reported above the average, with cotton and stock peas small; young clover is damaged much by the drouth. McNairy County reports crops in fine condition, but needing rain.

In Stewart County crops are reported as damaged by the drouth, but recent rains have helped some. Dry weather has done a great deal of damage in Houston County. All crops are reported as cut short in Humphreys County. In Decatur County crops are reported as suffering since the rain on the 11th. Scattered showers in Perry County have helped crops in some sections of that county.

Hardin County reports rain as badly needed. A two-thirds tobacco crop is reported in Montgomery County, with rain badly needed. Robertson County reports bad stands of tobacco on account of the drouth; a good crop of wheat is reported in this county, and also a good hay crop saved. Cheatham County reports crops badly damaged on account of the drouth; the correspondents estimate the crop reduced one-half.

In Lewis County the corn crop is reported damaged on account of the drouth. Wayne County reports a fine rain on the 12th, which helped crops. Late corn is reported good in Lawrence County. The corn crop is reported as damaged one-third in Clay County; tobacco is also reported short in that county.

Crops are reported looking well in Pickett County, but needing rain. Wheat and winter oats good in Overton County; corn is needing

rain badly. Sections of Jackson County report the worst drouth since 1881. Corn is reported looking fine in Putnam County, but needing rain. White County reports damage from drouth. Warren County reports all crops cut short by the dry weather. Coffee County makes the same report. Dry weather has cut alfalfa and clover short in Franklin County. Sumner and Smith counties report rain badly needed. The hay crop in these counties was saved in fine condition.

Rutherford County reports all crops well worked, but needing rain. Maury County reports the finest wheat crop in many years, with corn needing rain, and Irish potatoes very poor. Crops are reported looking well in Giles, but damaged some by the drouth. Lincoln County reports that dry weather has injured all crops.

Van Buren, Grundy, Campbell, Anderson, Sequatchie and Bledsoe report rain badly needed. Sullivan County reports corn damaged by dry weather. In Hawkins County the hay crop is reported a little short of the average, but wheat above the average and in fine condition. Hancock, Washington, and Hamblen report rain badly needed. Other counties in East Tennessee also report damage from dry weather.

Below is the summary, for comparison, of the reports of this department for the month of July, 1912 and 1913:

	1912.	1913.
	Per Cent.	Per Cent.
Cotton, condition	69	83
Wheat, estimated yield.....	11	17
Oats, estimated yield.....	22	28
Millet, condition	84	73
Corn, condition	81	81
Tobacco, condition	85	72
Stock peas, condition.....	87	81
Irish potatoes, condition.....	85	75
Sweet potatoes, condition.....	81	81
Sorghum, condition	80	77
Tomatoes, condition	87	77
Peanuts, condition	76	83
Young clover, condition	86	64
Live stock, condition.....	88	87
Hay crop saved.....	61	76
Alfalfa, condition	85	82

[illegible]

JULY CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Cotton—condition.	Wheat—estimated yield.	Oats—estimated yield.	Millet—condition.	Corn—condition.	Tobacco—condition.	Stock Peas—condition.	Irish Potatoes—condition.	Sweet Potatoes—condition.	Sorghum—condition.	Tomatoes—condition.	Peanuts—condition.	Young Clover—condition.	Live Stock—condition.	Hay Crop—saved.	Alfalfa—condition.
J Cumberland Table-land and Valley of East Tennessee.	Claiborne	.....	14	25	100	90	.....	100	80	75	.....	100	.....	75	100	100	.....
	Campbell	.....	14	18	.....	50	.....	65	70	60	.....	75	.....	.....	80	75	.....
	Anderson	.....	15	20	.....	95	.....	80	85	95	60	75	.....	90	95	95	.....
	Rhea	.....	15	20	80	.....	70	70	90	90	70	60	80	70	80	85	85
	Bledsoe	.....	70	15	20	75	.....	70	50	100	75	75	.....	40	80	65	.....
	Sequatchie	.....	16	15	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Marion	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Hamilton	.....	.....	.....	.....	70	.....	.....	50	.....	.....	50	50	.....	95	100	.....
	Sullivan	.....	15	30	50	.....	76	.....	50	85	25	.....	75	.....	75	85	90
	Hawkins	.....	14	30	.....	.....	90	.....	75	50	50	.....	75	.....	50	100	80
K East Tennessee Valley.	Hancock	.....	16	15	.....	75	.....	50	60	65	60	37	.....	50	80	75	.....
	Washington	.....	16	23	80	.....	.....	75	75	80	.....	80	.....	75	95	95	.....
	Hamblen	.....	15	25	80	.....	.....	75	80	95	90	75	.....	75	90	75	.....
	Grainger	.....	14	30	80	70	.....	75	60	80	65	80	.....	70	85	90	.....
	Union	.....	16	15	.....	90	.....	80	90	.....	.....	.....	.....	90	85	85	.....
	Jefferson	.....	16	12	80	.....	.....	90	.....	.....	.....	.....	.....	75	100	90	.....
	Knox	.....	18	.....	85	90	.....	95	60	80	.....	50	.....	65	90	95	75
	Roane	.....	15	20	75	50	.....	60	75	75	75	50	.....	50	100	50	.....
	Loudon	.....	14	30	75	90	.....	85	85	75	75	80	.....	50	90	65	.....
	McMinn	80	20	30	66	95	.....	80	60	80	60	75	.....	90	90	70	.....
L Valley of East Tennessee and Unaka Region.	Meigs	80	15	.....	70	.....	75	80	70	70	70	75	.....	70	95	95	80
	Bradley	80	20	30	40	90	50	80	100	100	80	80	50	50	80	100	.....
	James	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Johnson	.....	16	30	75	80	50	90	75	60	80	50	.....	75	90	25	.....
	Carter	.....	16	15	90	60	.....	100	90	90	85	80	.....	95	100	95	90
	Unicoi	.....	.....	.....	.....	80	65	75	90	90	80	70	.....	80	90	85	80
	Greene	.....	20	30	.....	.....	.....	75	90	90	80	70	.....	75	85	75	85
	Cocke	.....	10	25	75	.....	.....	80	95	90	95	95	.....	75	80	90	85
	Sevier	.....	14	14	.....	85	.....	90	95	100	80	100	.....	100	80	90	.....
	Blount	.....	16	15	75	50	.....	75	40	80	30	75	.....	70	85	90	85
General average	Monroe	.....	15	25	50	80	.....	80	60	90	90	60	.....	50	90	60	95
	Polk	80	20	30	50	75	60	90	75	90	85	55	75	85	85	75
	General average	83	17	28	73	81	72	81	75	81	77	77	83	64	87	76	82

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IN THIS ISSUE:

Some Reasons for Disappointment in Corn Crops.

Interest of Business Men in Agriculture.

What is the Trouble With Tennessee.

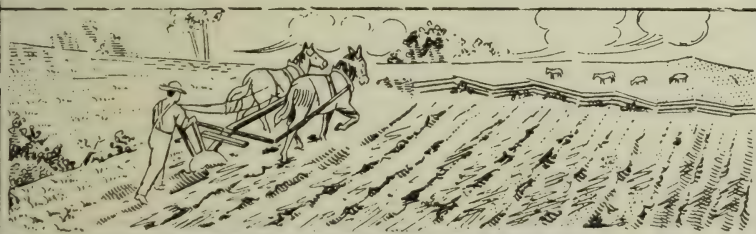
The Sheep Industry of Tennessee.

Interesting the Children of the Farm.

Farmers and Stock Raisers.

Tennessee as a Fruit Growing State.

August Crop Report.



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TALKS ON TIMELY TOPICS.BY T. F. PECK, *Commissioner of Agriculture.*

SOME REASONS FOR DISAPPOINTMENT IN CORN CROPS.



I have just been over a field of corn that is not going to make the yield it should and would if it had been given the right cultivation throughout the cultivating season. The man broke his land deep last fall and followed the turning plow with the subsoil plow. In the spring he prepared a good seed bed and planted it well; he started out well with his cultivation, but his wheat harvest came on and he let the sprouts and weeds get well established and they drew on his

available supply of plant food and retarded the growth of the corn with the result that his corn has a round instead of a flat stalk; has a light instead of a dark green color. He has started to clean it out, but the neglect will cut off from one-fourth to one-third of the yield per acre if it had been kept clean. He cannot realize that the loss he has sustained is at least five times what it would have cost to have kept it clean.

So many farmers overcrop or slack off when the sun gets hot, and the neglect at the time seriously affects their yields. The successful farmer is the one who pushes his crop all the time instead of letting his crop push him. It is poor economy to do 90 per cent of work on a crop and neglect 10 per cent at a critical time that will cut the yield half in two. I have seen many farmers do so. I have also seen corn planted too thick and neglect to thin until the corn was waist high, the extra stalks robbing those remaining of just that proportionate amount of plant food. Corn should be thinned just as soon as danger of the cut worm is passed when it is six inches high. It is better still to be careful in the selection of seed. Plant just as you want the corn to stand. The occasional missing stalk does not amount to as much loss as the drain on the plant food where the corn is planted too thick and allowed to stand too long without thinning. It is poor economy for a farmer to



**A Caterpillar Traction Gasoline Plow at work on Lespedeza Farm,
Hickory Valley, Tennessee.**

spend money for fertilizer to grow a crop of corn, then leave it standing too thick too long or allow weeds and grass to grow along with the corn and take up plant food intended for the corn. The farmer should never undertake to cultivate more than he is sure he can cultivate thoroughly and when it needs it, and he should know that anything allowed to grow with his corn is taking away just so much of plant food the corn should have. Anything that is worth doing at all is worth doing well. The man who practices this truth will succeed while the slipshod way means failure every time.

WHY THE BUSINESS MAN AND SOME OTHERS HAVE AN INTEREST IN THE DEVELOPMENT OF THE AGRICULTURE OF TENNESSEE.

While touring the State last year with the Agricultural Demonstration Train, at one of our stops we were met by a large and enthusiastic crowd, but prominent among them was a pompous, overdressed man who, after glancing over the train, said: "Oh, I reckon it's all right for the farmers, but I am a business man; it's of no interest to me." His tone, gesture and bearing were indicative of his contempt for the farmer and everything intended for his betterment. I recall this case because I think he is a rare one, and it is to be hoped with his demise his kind will be entirely extinct.

That man was not enlightened enough to know that his business was

made possible and grew out of the needs of the farmer; that as those needs increased and the capacity of the farmer to provide for them was it possible for him to prosper in his business. If he had been the big, broad-minded business man he should have been, he would have realized that there was an opportunity for the farmer to gain some excellent ideas about every phase of farm work and farm life. That they would get inspiration to improve their farms, their live stock and to increase their production. He would have been a beneficiary because of the increased business resulting. Of course, there is a percentage of business from the farmers with their present producing capacity; that capacity should and can be made just four times what it is now. What would be the effect if the farmers' purchasing power was quadrupled?

Mr. Businessman, you are looking out for ways to increase your volume of business. Here is an element of trade capable of increasing four times its present volume. Can't you afford to lend your aid and encouragement to an industry with such possibilities for development?

You are not expected to quit your business and go to farming, but you can help the farmer in the development of better markets. You can encourage legislation that will be helpful to the farmer in securing and raising better stock. You can encourage better rural schools, better churches and better roads. You can assist in the dissemination of information of a practical nature that the farmer can understand and apply in his work. You can do much to stimulate the farmer to take more pride in his vocation. You can discourage the opinion that is fast dying out that the farmer is a hayseed, a green country bumpkin. You can help him in many ways, and while you are doing so and winning his grateful appreciation you will be building your own business at the same time.

What applies to the business man will apply equally as well to the professional man, the manufacturer and the railroads. That the management of the railroads regards the development of the farming industry is evidenced by their willingness to assist in any movement having that object in view.

The newspapers, that great force that moulds public opinion, are doing their full share towards helping to secure information that will be helpful to him. When the banking institutions, the manufacturers, the commercial organizations, the business men and the professional men realize that in lending their cooperation to the development of our agricultural resources they are promoting their own interests, then we will make headway worth while.

WHAT IS THE TROUBLE WITH TENNESSEE?

We import into Tennessee every year wheat, corn, oats, hay, rye, barley, apples, potatoes, milk, butter, meats and cheese, all staple products in Tennessee, and all can be produced right here in the State as well and as cheap as they can be produced anywhere. The money paid out that leaves the State runs into millions of dollars. Why should this money leave the State when the products it pays for can be produced better here?

Since earliest childhood we have heard orators grow eloquent over our matchless resources, the fertility of our soils, the abundance and purity of our water, the luxuriance of the grass on our meadows, our fields of golden grain, our herds of cattle, our flocks of sheep. To hear them one would think Tennessee was a veritable El Dorado.

The pictures they portray are pleasing and possible. Our Creator has made them possible, but what have we been doing? Have we been using as we should this possible El Dorado? It does not appear that we have, when we enumerate the many things we are importing into Tennessee. It does not look like it when we travel over the State and see the many evidences of abuse this favored land has been subjected to. We see gullied and washed hillsides. We see weeds and briars growing where there should be waving the golden grain.

The herds and flocks are few and far between. There is much we find that does not fit in the pictures we have heard so eloquently word-painted so many times.

I would prefer to follow in the same vein if facts would bear me out, but you know they would not. So long as we import the staples we now import when they should and could be produced here we had better face the music, find out the cause and try to remedy it.

The cause, broadly stated, is want of interest in the agriculture of the State. There has been much activity for several years in the development of our mineral and timber resources. This has necessitated increased mileage of railroads. With the railroads came manufacturing establishments. New cities and towns have grown up, all increasing the consumption of farm products and at the same time decreasing farm production because the increased demand for labor was largely supplied from our farms. Then, too, the public schools in the past have educated the boys and girls away from the farm instead of to the farm. The country schools have been neglected in a measure. The new, inexperienced teachers have been sent to the country schools. The boys and girls have had held up to them as ideals men and women

who had become famous in some of the professions and encouraged to qualify themselves for professional careers.

Farmers, if they secured educational advantages for their children, had to move to the towns and villages. The boy and girl neither had a chance to see nor hear anything to encourage them to stay on the farm. It is not to be wondered at that they wanted to get away from the farm, and it is easy to understand why we are importing so much that we should be producing in Tennessee, and that before another five years, we will be producing in Tennessee.

You have heard it said, "There is no lane so long without a turn." We are rounding the turn. The high cost of living is helping us. The faithful few have been working long for better agriculture. They have succeeded in interesting a few in different portions of the State. Those few have been improving their land and practicing modern, scientific methods. Now with the prevailing high prices and their increased production they are prospering.

The newspapers, always in the forefront of progress, are lending their aid in popularizing agriculture as a vocation and in the dissemination of information valuable to the farmer. The railroad managers are awake to the value of a progressive agricultural section along their lines and are lending every possible intelligent aid to the development of the farm land along their lines.

Those at the head of the public school system of the State have changed their policy and now encourage the teaching of agriculture and domestic science. The progressive farmer is now regarded as the shrewd man of business. The comic supplements of the Sunday papers no more caricature the farmer as the hayseed and country bumpkin. The leaders in agricultural development are eliminating the theorist and putting in his place the teacher and lecturer who talks practical common sense in language the farmer can understand.

While we are importing many things we should be raising at home; while there is still evidence of neglect and indifference on the part of the farmers of the past, we are going to decrease the imports with home products and we are going to cover with a mantle of green the gullied hillsides, evidences of the poor farming of our predecessors. Then we can in truth boast of the richness, grandeur and beauty of our own redeemed Tennessee.

THE SHEEP INDUSTRY OF TENNESSEE.

The sheep industry of Tennessee could be made one of the most profitable branches of live stock husbandry in this State. The entire

State is well adapted to this industry, and especially are the Middle Tennessee and Eastern sections.

As is well known, one of the chief reasons the industry is not more flourishing in Tennessee is the presence of the cur dog. Great benefit would accrue to the farmers of the State if we had more drastic laws for the elimination of this menace to the sheep industry. Even the law we have on the book (requiring the registration, with a \$3.00 fee, of female dogs) would be of great benefit if rigidly enforced, as it would result in the destruction of many of these, and a consequent beneficial decrease in the number of sheep-killing dogs.

However, in a State like ours, sheep may be profitably raised regardless of this enemy. Extra precaution to guard the flock from dogs, though somewhat increasing the cost of keep, will repay the farmer, providing the flock has been properly managed otherwise.

Much of the gullied land and waste hillsides of this State could be profitably used in the production of sheep. This has been proved to the satisfaction of some of the most prominent farmers of the State. Much of the land which now grows only weeds could be restored to profitable tillage by the use of sheep.

The farmer who is willing to give to sheep the same amount of intelligent care that he gives to other live stock will find them not only profitable but good soil improvers, bringing into cultivation large areas of otherwise waste land.

The Federal census shows remarkable fluctuations in the sheep industry in Tennessee. In 1850 the census showed 811,591 sheep in Tennessee. The figures in 1860 were 773,317. In 1870 there was shown an increase to 826,783. On down to 1900 there was a continual decrease, as follows: For 1880, 672,789; 1890, 540,996; 1900, 307,804.

According to the last census, 1910, there were in the State 795,033 sheep, valued at \$3,009,196, or \$3.78 per head. Less than one-eighth of the entire number of farms in the State reported sheep, so that it may be seen at a glance what the industry could be made to do for Tennessee if all the farms had this as a branch of the live stock industry.

This industry is more extensive in Middle Tennessee, as shown by the figures for the following eleven counties in that grand division:

County.	No. Sheep.
Bedford	56,598
Davidson	22,160
Giles	23,388
Lincoln	42,430
Marshall	34,317

Maury	48,346
Rutherford	28,397
Smith	29,489
Sumner	40,084
Williamson	45,951
Wilson	56,806
<hr/>	
Total	427,966

It will be seen that these eleven counties in the Middle Division have more than one-half of all the sheep in the State. The farmers who are giving their attention to this industry are finding it a source of good profit and are enriching their land for future profit. I hope the farmers all over the State will wake up to the possibilities and advantages of the sheep industry, and that the State will get back to the position it occupied in 1850, when a fleece from a Tennessee sheep won the first prize at a world's exposition in London.

INTERESTING THE CHILDREN OF THE FARM.

In the "Saturday Evening Post" issue of August a writer tells of Prof. P. G. Holden's experience as a school teacher and the means he employed to interest his pupils in nature study and the splendid results he obtained. I hope every school teacher in Tennessee will read that article carefully.

Tennessee is disposed to deal liberally with the schools, and when the teachers can reach and interest their pupils as Prof. Holden did, the lawmakers of the State will meet their requirements for funds. The paramount industry in the State is agriculture. Our prosperity depends upon the producing capacity of the farmers.

We can reach and interest and assist the farmers to better methods through their children. If we have the prosperity among the farmers we should have, we must have them to increase the producing capacity of their soils. They must be made to understand the importance of seed selection.

It is easy for the teachers to get their pupils interested in these questions and they will not only make more progress with their studies, but they will get their parents interested. The child has seen plants growing all its life and it has wondered how and why.

We all want to know the why of things. We can take more interest when we understand the object for which we are working. When the

teacher blends into the lessons the child is to learn something it comes in contact with daily, the lesson will cease to be dull and uninteresting. The child will be eager to learn.

Our textbooks could be more interesting if the illustrations and exercises featured things that enter into the daily life of the student. In connection with every school there should be a seed testing department and a school garden. Get the children in and familiar with the life history of plants.

The teacher who wants results and is willing to think and work for them can so plan the work that they will easily interest every pupil and have them so they will go about learning their lessons with enthusiasm instead of reluctance.

We must begin at the beginning and take the child a step at a time. The trouble we have today in enlisting the adult farmer in scientific agriculture is in the fact that we have presumed that he had information that he has had no opportunity to acquire. We did not begin at the beginning, and have been trying to teach him things that he was not in position to grasp, telling him to do things that he was not equipped to do.

It is not so much the fault of the farmer that he is skeptical of what he terms "book farming" as it is the fault of those who have been talking over his head and suggesting impractical things for him to do. The United States Department of Agriculture realizes this fact, and as a result we have the "farmers' bulletins" and the field demonstration work. When you go to the farmer and show him how he can build up his soil and increase the production of his crops with the equipment he can afford you will enlist his interest and active cooperation.

There is an abundance of valuable information that has been worked out by the experiment stations. What we need to do is to disseminate that information in a practical form so that the small farmer can practice it on his own farm with the equipment he can afford.

While it is essential that agriculture be taught in a practical way in our schools, colleges and universities to broaden and develop the science of agriculture, it is equally important to help the farmer of today who has been deprived of the advantages of an agricultural education. There is much that we can do to improve his condition. I know many men who have been deprived of educational advantages that are prosperous farmers. They are men who think, men who profit by their and others' mistakes and successes, men who study nature's plan in the question of soil reclamation.

They have seen fields cultivated until they ceased to be profitable

and thrown out. They have seen nature go about restoring them by growing vegetable matter on them and letting it decay and mix with the soil. They know in time that soil will again be productive when nature has supplied the humus and got it incorporated in the soil. They knew that they could take run-down soil and follow nature's plan. They would prevent washing by deep plowing. They would level up the surface to cause a more even distribution of the water from rains. They would grow crops to turn under to increase the humus, improve the mechanical condition of the soil, releasing the mineral elements locked up in the subsoil they had broken up. Any farmer can understand how to do the same if it is presented to him in plain terms and he can do with the equipment he can afford. He cannot scratch over as many acres, but he can cultivate a few acres right and get better returns than from so many acres not half worked.

The boys' corn club work has been of great value not to boys alone but to the boys' fathers. I have heard some of them say that if it was good for the boys it would be good for them and they are falling into line. When our school teachers get their pupils interested they will get their parents interested and we will be making real headway towards developing the possibilities both of the farms and farmers, and with that development will come real prosperity for all the people of Tennessee.

GROW MORE SHEEP.

Macon County farmers should grow more sheep. No county in the State is better adapted to profitable sheep raising.

James Story, a farmer of the Third District, has eight ewes that raised twelve lambs. These lambs were sold for the neat sum of \$73.20, an average of over \$12 per ewe. Mr. Story has one ewe that raised three lambs. The three weighed 226 pounds when sold and brought \$16.95.

Of course, every farmer wouldn't expect to do this well with all his sheep—we merely mention this instance to show the possibilities of sheep raising here—but cut these figures in two and that is making money. We need to grow more live stock, especially sheep.

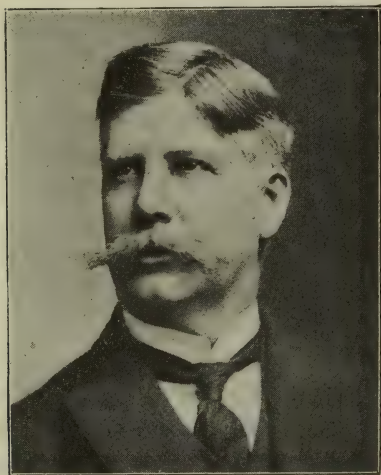
Grow more sheep and fewer dogs and you will have more money and fewer debts.—*Macon County News*.

Poultrymen who have tried it claim that a teaspoonful of Venetian red in a gallon of drinking water is a good bowel-trouble preventative.

FARMERS AND STOCK RAISERS.

SUGGESTIONS TO THEM WHICH SHOULD PROVE OF GREAT VALUE.

BY JUDGE ROBERT EWING.



Please allow me, as a member of the Agricultural Committee of the Nashville Board of Trade, to submit a few observations which I hope farmers and stock raisers will read :

1. The animal husbandry branch of the National Agricultural Department is sending out statistics which show conclusively that the beef cattle industry of the United States is in an alarming condition, and that unless radical steps are taken to at least check the rapid decline of supply it will soon be im-

possible for people of reasonable means to buy beef. This will prove a great calamity, which ought, if possible, to be prevented. These statistics show that the United States has practically ceased to export cattle; that on the other hand it will immediately have to attempt to become an importer; that conditions in those countries from which it will have to import are not at all favorable, and that England and other European countries to which the United States has heretofore been exporting will be keen bidders against us for the limited supply. It seems to be absolutely certain that even if Congress admits cattle free the shortage of supply is so great that very profitable prices to raisers of cattle will certainly continue for very many years to come. The free grazing in the far West, which for twenty-five years past has depressed the individual raiser, is now forever a thing of the past.

2. The individual raisers, therefore, in every State where cattle can be profitably raised are now the only ones who can be looked to to remedy matters. If they go at the business vigorously, with the superior knowledge of the industry they now have, or can easily obtain, they will have a great chance to make a good profit. They will reap the two-fold advantage of very high prices for their cattle, and also the very appreciable improvement of their land which the presence of cattle on it brings about.

3. Nearly the whole of Tennessee is peculiarly adapted to cattle raising. The climate is excellent. The water is pure and abundant.



Devon Bulls.

The soil naturally produces, to last for the greater part of the year, nutritious grasses for grazing. Further enriched by the stay of cattle, all kinds of roughage and feedstuffs can be raised, which should be fed and not sold in open market, for mathematical calculations of undoubted truth show that increased flesh of the cattle and increased productivity of the soil yield the farmer more than he receives by sale of these products in the open market. New lands can no longer be purchased at the former low figures. The fertility of those, therefore, which we have, and must occupy, should be maintained at all hazards, and the contribution of cattle to this life-preserving course cannot be justly ignored.

4. Every desired aid to engaging in the industry is now at hand. Bankers, if applied to and thoroughly informed and squarely dealt with in a business-like way, will extend reasonable aid for a start and maintenance of the business. They know the situation and realize that a part of their prosperity depends on a proper remedy being applied. There is certainly no reason why they should not aid this industry as they would any other. The industrial department of every railway which traverses the State is keenly alive to the acute situation. These departments are not waiting to be called on. They are seeking the farmers, bringing them together, furnishing all necessary information, and finally granting service as reasonable as existing laws permit. Talks with the heads of these departments will show the truth of this statement. Interchange of views among raisers at these meetings aids every one. Literature is disseminated which is ex-



Red Poll Cattle.

pressed in the plainest and most helpful way. No sensible farmer can read these printed words of men of experience without being benefited. The State Agricultural Department is lending its aid in the eradication of every pest and disease which afflicts cattle and seems determined, by efficiency, to keep the reputation of Tennessee cattle at a high standard.

5. One thing will have to be done: The slaughtering of calves will have to be stopped. Male calves must be kept until their weight contributes appreciably to the supply. Females should by all means be preserved for purposes of reproduction. This may appear on the surface unprofitable, and because of this false appearance it may be difficult to bring about this necessary reform. But the situation is so acute that unless this is done, even a partial cure of the trouble is hopeless, for that increased production can be brought about only by preserving the means of doing it is as true as that night follows day.

The situation in one view is truly desperate; in another hopeful, especially to Tennesseans, because of the plain opportunity offered to farmers of engaging, on however small a scale, in a business which is sure to prove profitable to themselves and helpful to all others. Farmers and stock raisers, will you not consider the situation and resolve in favor of beginning at once?

The wide-awake, ever-watchful poultryman is seldom troubled with sickness among his fowls.

FABLE OF THE "CALF PATH."

BY SAM W. FOSS.

One day through the primeval wood
A calf walked home, as good calves
should;

But made the trail all bent askew
A crooked trail, as all calves do.
Since then two hundred years have
fied,

And I infer the calf is dead.
But still he left behind his trail,
And thereby hangs my moral tale.
The trail was taken up next day
By a lone dog that passed that way.
And then a wise bellwether sheep
Pursued the trail o'er vale and steep,
And drew the flock behind him, too,
As good bellwethers always do.
And from that day o'er hill and glade,
Through those old woods a path was
made;

And many men wound in and out,
And dodged and turned and bent
about;
And uttered words of righteous
wrath

Because 'twas such a crooked path;
But still they followed—do not
laugh—

The first migrations of that calf;
And through this winding woodway
stalked,

Because he wobbled when he walked.
This forest path became a lane
That bent and turned and turned
again;

This crooked lane became a road,

Where many a poor horse, with his
load,

Toiled on beneath the burning sun,
And traveled some three miles in
one.

And thus a century and a half
They trod the footsteps of that calf.
The years passed on in swift
fleet,

The road became a village street,
And this, before the men were 'ware,
A city's crowded thoroughfare;
And soon the central street was this
Of a renowned metropolis.

And men two centuries and a half
Trode in the footsteps of that calf.
Each day a hundred thousand rout
Followed the zigzag calf about;
And o'er his crooked journey went
The traffic of a continent.

A hundred thousand men were led
By one calf near three centuries dead;
They followed still his crooked way,
And lost one hundred years a day,
For thus such reverence is lent
To well established precedent.

A moral lesson this must teach
Were I ordained and called to preach.
For men are prone to go it blind
Along the calf-paths of the mind
And work away from sun to sun,
And do what other men have done.
They follow in a beaten track,
And out and in, and forth and back;
But still their devious course pursue
To keep the path that others do.

A poultry authority says that if the egg is placed on one side or large end heavy yolk will settle to the bottom and come in contact with the shell, which admits the air. If it is placed on the small end, it will always have a layer of white between it and the shell.

TENNESSEE AS A FRUIT GROWING STATE.

By G. M. BENTLEY, *State Entomologist.*



The fact that Tennessee is well suited for fruit growing is fast coming to be recognized. With her suitable climatic and soil conditions and quantities of cheap highlands, Tennessee is rapidly proving that fruit growing has a bright future. Her location from the great distributing centers, together with the splendid railroad facilities and the accessibility of those parts of the State having ideal orchard sites are factors having far-reaching importance in the selection of fruit lands.

Tennessee has 351 nurseries growing stock to be shipped to all parts of the United States and Canada, as well as to many foreign countries. An apple tree will grow in two years to equal a three or four-year-old tree grown in the North. This is attributable to the extended growing season and the increased amount of rainfall.

Comparing two of the fruit States, Ohio and New York, with Tennessee, we find a difference of nine to ten inches of rainfall in favor of Tennessee. In the length of growing days, a difference of forty to fifty days more in Tennessee than in the States mentioned above. Thus it is plain to see why the farmers and fruit growers in Tennessee have natural advantages possessed by few States.

From the State nurseries the orchardist can procure his trees fresh and in a vigorous condition, and may, if he so desires, go direct to the nursery and select each tree for the orchard. This enables him to get shapely, young trees with well-formed root systems, trees uninjured by poor packing and careless handling while in transit from distant States.

The sites for orchards in Middle and East Tennessee are many at present, but these are fast being taken up by orchardists from this and other States. It will only be a matter of a few years before her fruit interest; will form one of the great assets of Tennessee.

The fact that Tennessee is well situated and the soil is exceptionally adapted for the growing of early apples, peaches and cherries, as well as many of the smaller fruits, has only within recent years been realized, and the growing of these fruits is now being rapidly increased

by the setting of new commercial orchards. These orchards are being set and handled according to modern methods of planting, cultivating, pruning and spraying.

The fruit growers realize that there is no better way to keep up with the ever advancing horticultural science than by being a member of some live horticultural organization. To this end eight years ago there was formed a State Horticultural Society. This society meets annually at Nashville for a three days' convention, in conjunction with the State Nurserymen and Beekeepers. This organization has grown in membership and has accomplished much by way of creating a better understanding between the grower and the planter of fruit trees and has been successful in bringing about legislation protecting their interests. The organization is active and its annual meetings are well attended by representative fruit growers not only from Tennessee but by those from adjoining States.

In fruit growing Tennessee stands well in the front and in the near future will hold a reputation surpassed by few States in the production of highly colored and richly flavored fruit.

FAIR DATES FOR 1913.

Postoffice.	County.	Dates.	Secretary.
Alexandria	DeKalb	Sept. 4-6	Rob Roy.
Celina	Clay	Sept. 10-12	W. F. Brown.
Carthage	Smith	Sept. 11-13	S. M. Corley.
Coal Creek	Anderson	Sept. 23-25	W. L. Wilson.
Concord	Knox	Sept. 9-12	F. H. Boring.
Deer Lodge	Morgan	Sept. 23-26	T. F. Hayworth.
Dickson	Dickson	Oct. 7-11.	H. G. Sensing
Dresden	Weakley	Oct. 15-18	W. R. McWherter
Dyersburg	Dyer	Sept. 30-Oct. 4 ..	W. C. Paris.
Humboldt	Gibson	Sept. 17-20	C. W. Rooks.
Jackson	Madison	Sept. 30-Oct. 4 ..	W. F. Barry.
Kingston	Roane	Sept. 30-Oct. 3 ..	S. R. Sparks.
Leoma	Lawrence	Sept. 23-26	N. L. Powell.
Lewisburg	Marshall		C. C. Wallace.
Manchester	Coffee	Sept. 26-27	W. M. Hickerson.
Memphis	Shelby	Sept. 22-27	F. D. Fuller.
Morristown	Hamblen	Sept. 3-5	C. B. Weesner.
Murfreesboro ...	Rutherford		B. B. Kerr.
NASHVILLE	Davidson	Sept. 29-Oct. 4 ..	J. W. Russwurm.
Paris	Henry	Oct. 8-11	R. H. Hudson.
Pulaski	Giles	Sept. 23-26	J. D. Rhea.
Rhea Springs ...	Rhea	Oct. 6-11	H. B. Payne.
Selmer	McNairy	Oct. 14-17	W. K. Abernathy.
Shelbyville	Bedford	Sept. 17-29	W. E. Gant.
So. Pittsburg ...	Marion	Oct. 14-17	W. H. Wilson.
Spring City	Rhea	Oct. 7-11	J. W. Fischesser.
Sweetwater	Monroe	Sept. 16-19	Jas. R. Love.
Tullahoma	Coffee		John W. Harton.
Union City	Obion	Sept. 10-14	J. W. Woosley.
Winchester	Franklin	Sept. 2-5	T. B. Anderton.

TENNESSEE OFFERS OPPORTUNITY.

A little more than a year ago two brothers left the much vaunted California and located in Hickman County, Tenn., where they have gone into cattle and sheep raising, with a cheese factory as a side line to use up their spare time. These young men are of the hardy pioneer type. They were reared in Michigan and in their quest for a place that suited them harvested wheat in Kansas, raised fruit in Oregon and herded cattle in Northern California. They were attracted to Tennessee by a real estate advertisement and it did not take long for their acute minds to grasp the possibilities that lie on every side in Tennessee.

They had faced real hardships and had known privation, so it didn't feaze them to go back into the hills twelve or fifteen miles from a railroad and take up a large tract of land that was looked upon by the inhabitants as being practically worthless since the timber men had been over it with their sawmills. It was there that they started their cattle and sheep ranch and began the manufacture of cheese. They are succeeding and say that Tennessee is a better place to live in than either California, Oregon or Kansas. The world knows it is a better place than Kansas, but it is not so well known that Tennessee has the best over California and Oregon.

Immigration of stalwart farmers and tradesmen from other sections of the country into the South is just beginning. Tennessee, from the moutains to the Mississippi, offers magnificent opportunities for them, but with its fertile, level land, variety of soil and excellent pasturage Middle Tennessee seems to be the favored spot of the State for farming and cattle raising.

Our brothers of other States are cordially invited to come South, come to Tennessee and settle in Hickman County.—*Hickman County Citizen.*

SOME SYSTEM IS NECESSARY.

Poultry keeping is a business and should be conducted along business lines. Some system of accounting is necessary. The poultryman should keep records of all the income and expenses of his business in order to know whether it is a paying proposition or not. If it does not pay he should know it and either stop the leak or go out of business. An elaborate system of bookeeping is not necessary. If the poultryman wishes to avoid keeping full accounts he can at least keep a cash account. This does not express the exact financial condition of the business, but is an excellent help so far as it goes.

OF INTEREST TO BEEF EATERS.

The vice-president of a bank doing business in the stock yards district in Chicago, in a recent address, gave some figures that are interesting to the eaters of beef. The figures are worthy of the consideration of those who grow cattle for the sake of their meat, and likewise they are worthy of the consideration of the general public.

It was stated that on the first day of January, 1907, the total number of cattle in the United States, of all classes, was 72,534,000. On the first day of January, 1913, the figure had sunk to 56,527,000, showing a falling off of within a small fraction of 15,000,000.

It is estimated that the number of milk cows has remained practically unchanged. If the estimate of the milk cows be correct, then the beef cattle do not number over two-thirds of what it was six years



Aberdeen-Angus Cattle.

ago. At the same time there are 12,000,000 more people in the United States to eat beef than there were a half dozen years ago.

Conceding that the figures here given are substantially correct, who will wonder that one has to pay a much larger price for a beefsteak or a roast than was paid a number of years ago. Then the number of beef cattle in the country was very much larger, and the number of those who were eating beef was very much smaller.

With these and other facts that may be kept in view, the high price of meats is no mystery. But the number of cattle is being reduced all the time. The high price of meat, and the appetite for veal, leads to the slaughter of calves that are but a few weeks old. Here is a copy of a letter recently written to and published in the New York Times:

"In discussing the high price on meat with a butcher recently he

said that if we would only follow the example of the Argentine Republic and prohibit the killing of calves the shortage of beef cattle would soon disappear. He claimed that twenty million calves were killed every year to supply New York alone. I do not vouch for the accuracy of his statements, but if what he said was true the suggested remedy is a good one and well worthy of consideration. Of course, Uncle Sam could not make the States stop killing calves, but he could prevent their transportation in interstate commerce, which would help some."

That letter affords some food for thought. The love of money is reducing the supply of beef cattle.—*Knoxville Journal and Tribune*.

SHEEP RAISING.

Every farmer in Maury County should have a flock of sheep. They are one of the most profitable animals that the farmer can have. The investment is small and the risk is not great. It is, of course, inadvisable to have too many, but a small flock is almost a necessity for every farm. This country is especially adapted to sheep raising. It is generally free from disease. And, owing to the generally open and mild winters, the sheep can be taken through the winter and the lambs marketed without feeding either grain or hay. If the farmer is provident and sows cover crops in the fall, he not only takes care of his land, prevents washing and leeching, but at the same time assures himself an abundance of good winter pasturage upon which his sheep will thrive. Properly handled, there is no question about the profits from a flock of sheep. The surprise is that there are so few flocks in the county. In spite of the immense profits made during the season just drawing to a close, many farmers are closing out. They cannot resist the temptation of good prices for their ewes and bucks. This is unfortunate.

There is really but one menace worthy of consideration to the growing of sheep in Maury County, and that is the pestiferous and worthless dogs. One good ewe will bring the family more income than half the dogs in the county. In fact, the county would be infinitely better off if every dog in it were exchanged tomorrow for sheep. However, there is but one way to combat the dog nuisance, and that is to encourage the farmers to have sheep. The more farmers in a community having sheep, the fewer worthless, sheep killing dogs there will be in that particular locality. It will then be to the interest of the farmers to get rid of the dogs, and self-interest is a powerfully effective incentive to act.—*Columbia Herald*.

SHEEP RAISING.

The slogan in the South has for several years been "progressive," and yet there is a subject upon which several of the Southern States, and notably among them is Tennessee, have been rather retrograde than progressive and that is in regard to the sheep raising industry.

Instead of gaining, there appears to be an actual falling off in sheep raising and yet there never was a time in the history of the country—we might go farther and say there never was a time in the history of the world—when it and kindred industries yielded as profitable returns.

The study that has been given the prevention and cure of the diseases common to sheep has very much reduced the loss from this cause and the ever-increasing demand for fresh meat insures the ready sale of every member of a flock of sheep that can be spared by the raisers.

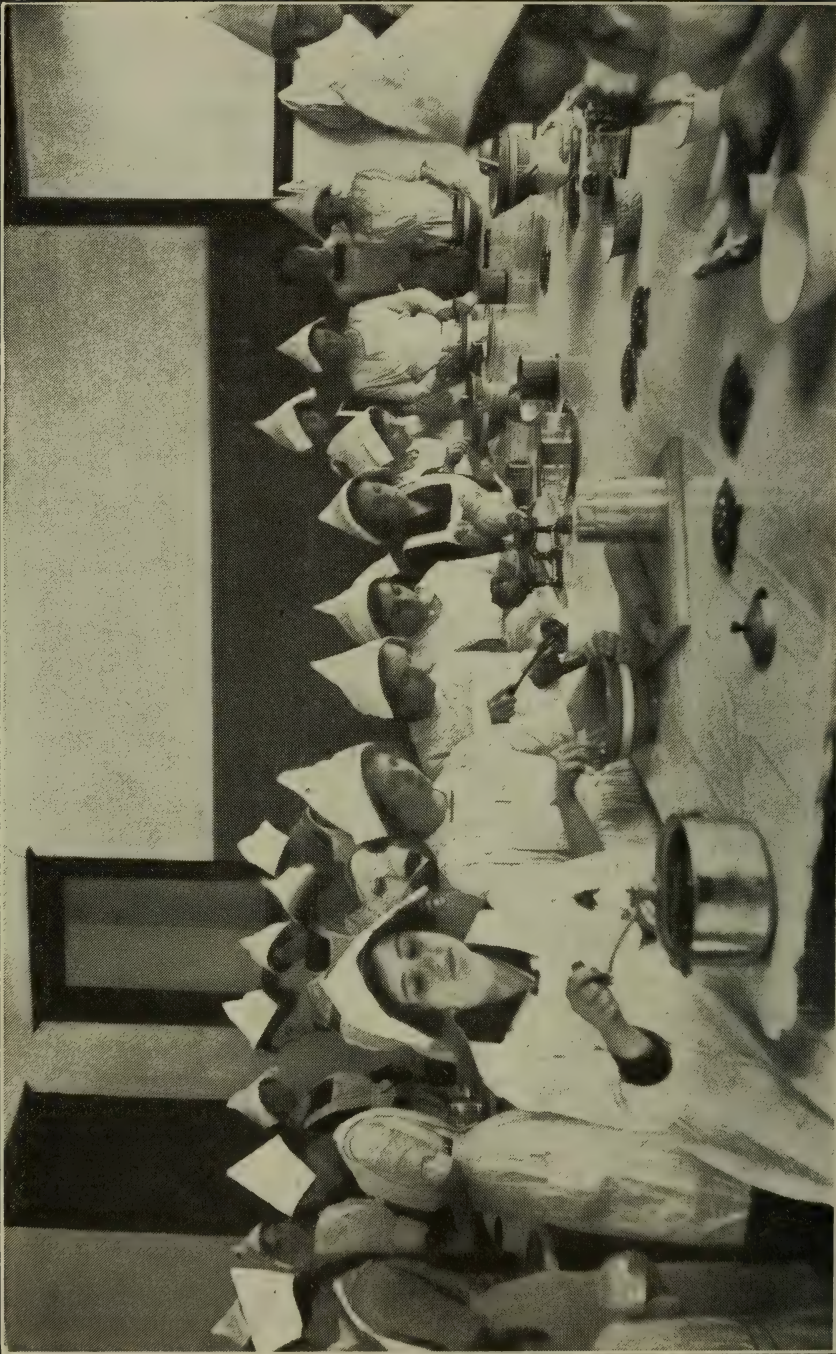
Wool, too, always commands ready sale at a good price and the keep of sheep is small in comparison with that of cattle, hence there is no reason that can be held valid to prevent sheep raising from becoming one of the leading industries in many of the Southern States.

Then why is it so neglected? In answering this question several things must be taken into consideration. In the first place, up to very recent times agriculture, primarily cotton growing, absorbed the attention of the South as a money producer almost to the exclusion of everything else, and the great opportunities offered for stock raising have been overlooked.

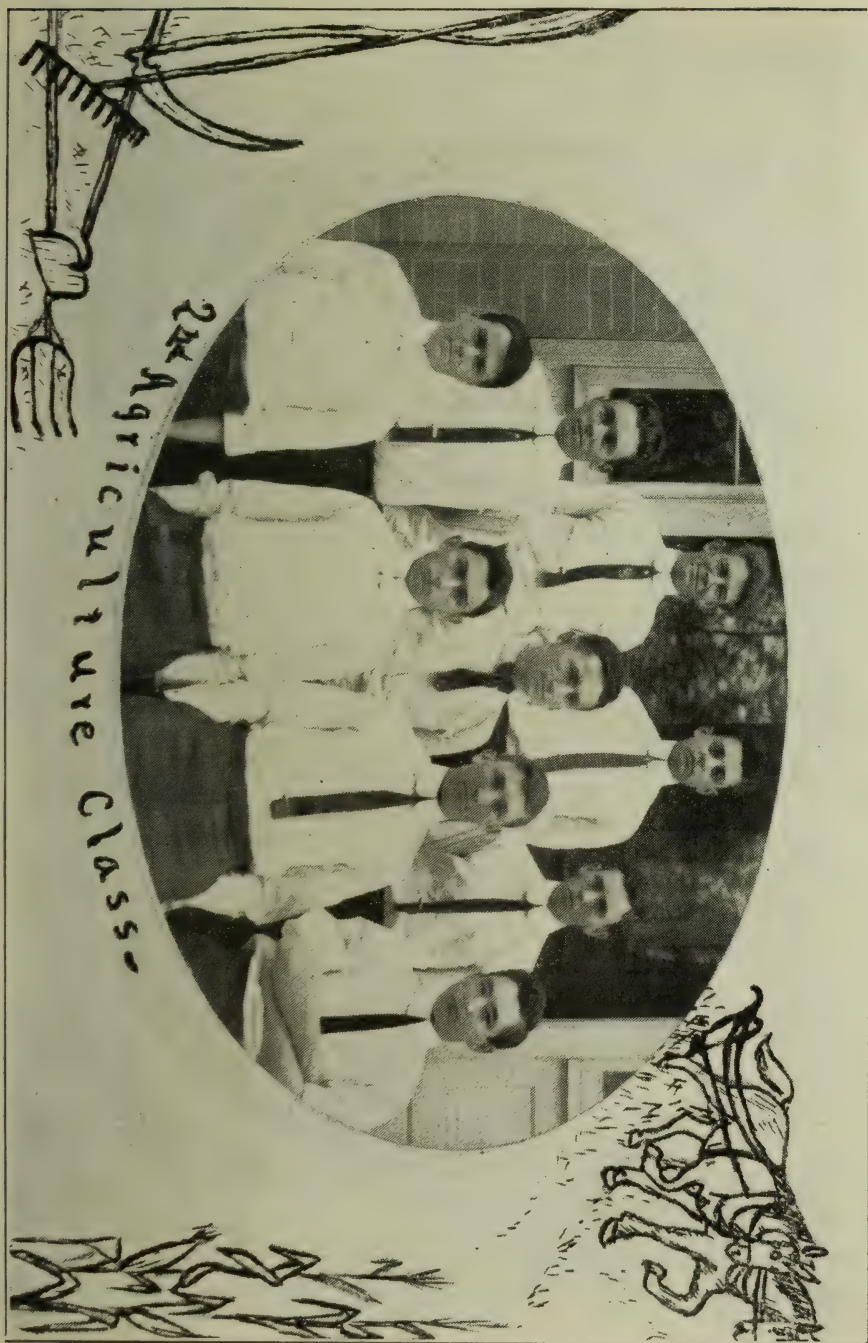
But the time is past when King Cotton held absolute sway and while other industries are fast taking their proper place in the South, sheep raising is still neglected to a lamentable degree and the most potent reason ascribed for it is that the toleration of sheep-killing dogs renders the profits to be derived so uncertain that few care to raise sheep.

A recent North Carolina editor, discussing the paucity of sheep and the number of dogs in his State, expressed the opinion that it could not be classed among the "progressive" States of the Union, and by the same token we fear that Tennessee must also be classed among the "moss-backs."

"Love me, love my dog" is being carried too far when a State is losing millions of dollars annually by it, and our State Legislature should enact laws sufficiently drastic to render sheep raising for profit possible in Tennessee.—*Jackson Sun*.



Domestic Science Class, Grove High School, Paris, Tenn.



Agriculture Class, Grove High School, Paris, Tenn.

WHY NOT IN TENNESSEE?

A number of Missouri men are reported to be preparing to acquire some 10,000 acres in Louisiana and go into cattle raising on a large scale. These gentlemen are surely overlooking an opportunity much nearer home when they pass by the chances open to them in Tennessee. We have no disposition whatever to belittle our sister State, but we venture the assertion that here are to be found all the things that go to make up an ideal stock-raising locality.

Land can be had in the hills and valleys of Tennessee at most reasonable prices, and of a quality that will produce all the hay, corn and other forage stuff needed for vast herds; this besides furnishing the very best of grazing for a much longer time than do the plains of the West. Details of the Louisiana scheme are not clear as to just what part of that State is to be the scene of the new project, but we are sure that the lands which are now given over to cotton and cane there cannot be turned to cattle ranges with advantage except after a lapse of many years, while here in Tennessee the pasturage is already assured, as are the fields for tillage and the woodlands for the sustenance of unnumbered hogs. No more inviting locality for this branch of agriculture exists in this country, and could those who are contemplating embarking in it be induced to come here and investigate there isn't a doubt that they would be convinced of the futility of looking further.

This is in reality a matter for the State Department of Agriculture, and we are sure the officials of that department will do all possible to further the State's interests in this direction; but the whole task should not be shouldered upon them. The wide-awake people of every county where lands suitable for stock raising are on the market ought to get together and make the fact known. Simply because the owners of the lands would reap a benefit ought not to stand in the way of a united pull to bring in people who have money to invest. Every dollar of such money advantages the whole county where it is spent; the merchant gets his share, the farmers find an enlarged market for their products, business of every sort is livened up and an impetus given to rural and urban life by the infusion of new blood and contact with folks from another section.

But the chief and immediate necessity is to let outsiders know what Tennessee has to offer them.—*Nashville Tennessean and American*.

The man in the moon should be mighty glad that he is not responsible for all the crop failures that are laid upon his habitation.

WHY FARMERS ARE FEWER.

Decrease of farm and village population, as viewed by an observer in Illinois, is not an alarming portent. John V. Hogan, in the *Journal of Political Economy*, gives a careful analysis of the movement of rural population in that state. First the facts:

Between 1900 and 1910 the population of Illinois increased about 17 per cent. The urban population increased more than 30 per cent and the rural population less than half of one per cent. Rural population is of two kinds, farm population and residents of villages under 2,500 inhabitants. The village population grew 11 and the farm population fell off 7 per cent. The whole movement was more accentuated in Northern than in Southern Illinois.

In the meantime improved farm acreage has increased by 350,000 acres, but the number of farms has fallen from 264,000 to 251,000, in by 5 per cent.

Rural free delivery has been enjoyed by 90 per cent of Illinois farmers for five years. The telephone, the automobile, the trolley, the country delivery wagon and consolidated schools have been multiplying.

It is argued by some that farmers are going to the cities because farm life is lonely. Mr. Hogan does not think the facts sustain this view. It is less lonely now than ever. Without examining the interesting question whether closer contact with urban life has not grown a taste for it, Mr. Hogan gives substantial reasons why there are fewer farmers and fewer farm laborers and fewer doctors, lawyers, merchants, preachers, teachers, and mechanics in small villages.

The utilities and conveniences that we have named save the farmer trips and time. Rural free delivery has brought better roads. Drags now maintain dirt roads in some cases like race courses; they are fit for automobiles and heavy wagons at all seasons. Farmers can haul goods to and from larger villages, attend churches there and visit doctors and lawyers there, instead of contenting themselves with smaller neighborhood centers. Rural free delivery has caused 700 fourth-class postoffices to be abandoned and it is assumed that farmers do not stop at a settlement where there is no postoffice.

Labor and time-saving machinery are in greater use. In 1900 farm implements and machinery in Illinois were valued at \$45,000,000 and in 1910 at \$73,000,000, the increase being 64 per cent, compared to an increase of 30 per cent in the preceding decade. Besides motors there are now 4.8 horses to 100 acres in Illinois and in 1900 there were 4.4. A man can cultivate more land than formerly. Hence the falling off in the number of farm residents is natural.

As to villages under 2,500, while they increased 11 per cent, taken together, 44 per cent fell off instead of increasing.

Mr. Hogan ventures a prediction that the decrease of farm population will be checked and that the abandonment of small villages will be accelerated in the next generation. Good roads are apparently expected to continue to offer wider markets to farmers and greater social opportunities and more intensive cultivation of farms to require more laborers than are now employed.

The phenomena described by Mr. Hogan may be observed in the less intensified form in all parts of the country. It remains to be seen whether the influences observed at work in Illinois will operate in the South also and to what extent and whether the tendency to leave the farm will be counteracted even sooner than in the North by the diversification of agriculture and greater devotion to vegetables and fruits than to staple crops.—*Chattanooga News*.

ADVICE TO SOUTHERN FARMERS.

James Wilson, who was Secretary of Agriculture at Washington since 1897, but who retired from that position on the 4th of March, made his final report and in it he ventures a few words of good advice to Southern farmers when he tells them to produce more of what the people of the South consume. Mr. Wilson says:

"The South is growing, the country is fertile, the people are apt and progressive, and they deserve great credit for the things they have accomplished in agricultural and manufacturing lines, to say nothing of social accomplishments. The soils are productive and adapted to a great variety of crops. The climate is good, and long growing seasons prevail. Lands are cheap, and I predict that within a few years it will not only be producing all the farm products consumed by its own people, but will be a greater power in national affairs and in our relations with the rest of the world.

"It is common knowledge that the South depends largely upon outside markets for its supply of meats. There is a great amount of lard, eggs, butter, poultry and cheese that comes from distant markets. There is ample uncultivated territory in the South to produce all these things in ample quantity to supply all demand for local consumption. Large amounts of potatoes, cabbage and fruits are imported. This should not be, and will not be the case very much longer. If the Southern farmers would cultivate grasses for pasturing they would not only be able to raise enough cattle to supply the demand of local markets, but could readily and profitably produce a supply for shipment to outside markets."

AUGUST CROP REPORT.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., September 1, 1913.**

The continued drouth has done great damage to the farmers of the State, especially in the reduction of the corn crop, and in the burning up of the pastures. Reports from crop correspondents in eighty-three of the ninety-six counties in the State indicate that the production of corn will be less than two-thirds of a normal crop. There have been no general rains in the State for weeks, and the reports from nearly all the counties are of serious damage to corn and pastures and clover.

From the cotton-producing counties of the State come reports encouraging for that staple. Reports at present indicate a 10 per cent better production this year than last.

The better prospects for cotton, the good wheat crop made and the good hay production, are the encouraging features in the crop production in Tennessee this year. The Irish potato production was largely reduced, and there will be also a considerable reduction in the sweet potato crop.

Reports from the peanut-producing counties in the State indicate about the same production as last year, while tobacco will likely show a decreased production.

Hog cholera is still prevalent in the State, but with the exception of this trouble the live stock of Tennessee shows in good condition. On account of the long drouth and failure of the pastures many farmers are disposing of their cattle.

EFFECT OF THE DROUTH.

An effort was made by the Department of Agriculture to obtain from the correspondents in the various counties an estimate of the damage done. The reports are incomplete, but indicate that the damage to the corn crop and pastures is very heavy.

Obion County reports no general rains since July 12, and that the corn crop will be reduced at least one-half; that cotton is shedding and young clover and pastures dying. Dyer County makes practically the same report, while Lauderdale indicates somewhat less damage, and with rain in a few days the statement is made that late corn would do well.

Tipton County reports that corn will be about an average crop and that crops were looking fine at the time the report was made, August 20. Shelby County reports conditions good, with the cotton crop looking much better than at this time last year. Weakley County reports corn damaged one-third, and young clover about 60 per cent, with pastures suffering for rain.

Gibson County reports damage from drouth not so severe, while Crockett reports a damage of about one-third. Madison County reports that local rains helped a great deal and that the damage to crops will not exceed 10 per cent.

Good crop prospects are reported from Haywood County, and also from Hardeman. Good reports also come from Fayette County, while Henry County reports severe damage. Carroll County reports about one-fourth damage to the corn crop, while Henderson County reports about 40 per cent damage as the result of a six weeks' drouth. Chester County reports indicate a damage of about one-half to all crops except cotton, and that crop is damaged some. McNairy County also reports considerable damage.

Stewart County reports that early corn was about made when the drouth set in, but that late corn is severely damaged, as is the tobacco crop. Prospects for little better than a half crop are reported from Benton, while Houston reports about 50 per cent damage. In Humphreys the damage is not so severe, while Decatur and Perry report damage of from 25 to 40 per cent.

Hardin County reports are of a damage of about one-third, while Montgomery reports about 50 per cent damage to the corn crop, and also considerable damage to tobacco. Robertson County makes about the same report as Montgomery.

Cheatham and Dickson Counties report about 50 per cent damage to corn and tobacco. Lewis and Lawrence report damage of one-fourth to one-third. Clay, Pickett, Overton and Jackson Counties report prospects for not more than a half crop of corn. Putnam and White reports are to the same effect. Warren County reports local rains have helped the corn crop in many sections of the county and that the damage will not be so heavy.

Coffee County reports a damage of about one-third to the corn crop, while reports from Franklin and Sumner Counties indicate the damage not so severe. Trousdale County indicates a damage of probably more than 50 per cent to the corn crop, while Smith County reports damage of 35 to 40 per cent.

Reports from Wilson, Williamson and Maury indicate damage to

corn of from 35 to 40 per cent. Marshall and Bedford report damage of probably more than 50 per cent to corn. Giles County's damage will be about one-third. Lincoln and Moore indicate damage of about one-half to corn. The damage in Scott will be about one-half and in Morgan one-third. Cumberland and Grundy indicate prospects for about two-thirds of a normal corn crop, and Campbell and Anderson a little better than one-half a crop.

Rhea and Bledsoe indicate about a two-thirds crop, as also do Sequatchie, Sullivan and Hawkins. Hancock, Washington and Hamblen claim the production of corn will not be more than one-half. Grainger, Union, Jefferson and Knox report damage of at least one-half to the corn crop. Roane reports about a two-thirds crop, while the damage in McMinn is estimated at about 50 per cent. Meigs reports prospects for about a two-thirds crop, and Bradley about one-half.

Johnson County reports that recent rains have materially improved the prospects for corn. Carter and Greene report prospects for about three-fourths of a corn crop. In Cocke and Sevier Counties the damage is estimated to be at least 50 per cent. In Blount, Monroe and Polk the damage is said to be about one-third.

In summarizing the crop situation in the State, it may be said that less damage has been done in West Tennessee than in the middle and eastern sections of the State. The indications are that the cotton crop will be better than last year. Taking the State as a whole, the corn crop will be reduced to nearly one-half of a normal crop. The yield of tobacco will be reduced and the quality deteriorated.

Below is the summary for comparison of the reports of the department for August for the years 1912 and 1913:

	1912. Per Cent.	1913. Per Cent.
Cotton, condition.....	73	81
Millet, condition.....	80	65
Corn, condition.....	78	63
Tobacco, condition.....	78	69
Stock peas, condition.....	86	67
Sweet potatoes, condition.....	79	71
Sorghum, condition.....	89	72
Tomatoes, condition.....	82	68
Peanuts, condition.....	76	77
Clover, condition.....	83	58
Live stock, condition.....	89	84
Alfalfa, condition.....	82	80

AUGUST CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.												
		Cotton—condition.	Millet—condition.	Corn—condition.	Tobacco—condition.	Stock Peas— condition.	Sweet Potatoes— condition.	Sorghum—condition.	Tomatoes—condition.	Peanuts—condition.	Clover—condition.	Live Stock— condition.	Alfalfa—condition.
A Alluvial Plain of the Mississippi River and Plateau Slope of West Tennessee.	Lake	60	30	50	75	75	60	75	65	70	80	75	
	Obion	75	55	55	75	70	70	75	75	80	65	85	
	Dyer	85	65	65	80	80	75	80	50	60	40	90	
	Laurel	65	75	75	90	90	90	90	85	80	80	80	
	Tipton	85	85	85	85	80	90	70	100	75	90	95	
	Shelby	100	100	100	100	95	100	90	90	95	95	95	
B Brown Loam Ta- blelands, Middle Counties of Tennessee.	Weakley	75	75	75	75	75	70	80	50	50	80	80	
	Gibson	85	85	85	80	80	90	90	85	85	90	85	
	Crockett	60	80	65	80	80	70	70	100	55	75	75	
	Madison	75	80	95	100	90	100	95	100	80	95	90	
	Haywood	85	75	75	75	75	95	80	100	80	95	90	
	Hardeman	90	75	90	75	75	70	70	80	65	90	80	
C Summit Region of Watershed, West Tennessee.	Fayette	80	75	80	75	75	90	90	85	80	50	90	
	Henry	55	75	70	70	80	75	75	80	85	65	85	
	Carroll	70	95	65	65	70	75	80	75	75	45	85	
	Henderson	60	60	60	60	60	45	60	75	50	70	70	
	Chester	70	80	70	70	65	80	80	75	30	85	85	
	McNairy	65	80	80	80	80	60	75	75	80	85	85	
D Valley of Tennes- see River, West and Middle Tennessee.	Stewart	80	90	60	65	60	90	70	65	100	75	75	
	Benton	65	60	60	60	60	60	55	60	65	55	80	
	Houston	60	60	60	65	70	55	55	65	65	80	55	
	Humphreys	60	60	60	40	70	70	40	60	60	55	80	
	Decatur	65	75	80	70	70	75	65	90	80	70	80	
	Perry	75	40	70	60	60	60	70	80	80	60	85	
Hardin	75	60	75	80	80	85	70	80	90	50	85		

E Highland Rim of Middle Tennessee, Western Subdivision.	Montgomery	75	55	70	55	45	55	75	80	60
	Robertson	50	55	65	70	60	65	60	85	85
	Chickama	65	60	80	70	75	50	100	30	85
	Dickson	65	50	85	45	85	85	100	45	85
	Hickman	55	70	90	60	65	80	70	40	80
	Lewis	75	65	80	70	80	75	65	35	85
	Wayne	75	65	80	70	80	75	65	35	85
	Lawrence	75	65	80	70	80	75	65	35	85
	Macon	50	50	60	50	85	80	60	35	85
	Clay	10	50	50	50	40	50	25	35	80
F Highland Rim of Middle Tennessee, Eastern Subdivision.	Pickett	85	50	80	70	70	70	25	35	85
	Overton	35	45	45	30	30	50	45	45	80
	Jackson	65	65	55	45	70	70	70	45	80
	Futnam	50	50	50	50	50	40	40	45	80
	DeKalb	80	60	60	70	80	70	90	50	85
	White	75	70	80	45	70	80	65	75	85
	Warren	80	85	70	85	80	90	80	70	85
	Coffee	60	80	80	90	80	90	50	50	80
	Franklin	75	65	75	70	75	80	65	80	80
	Sumner	50	55	50	75	75	75	80	80	85
G Central Basin.	Trousdale	100	50	85	90	85	95	75	55	95
	Smith	80	75	80	75	75	60	60	30	80
	Davidson	55	65	40	75	75	60	60	30	80
	Wilson	95	60	50	80	70	60	70	45	90
	Williamson	75	40	40	50	30	50	65	25	75
	Rutherford	75	20	45	45	45	50	50	25	95
	Cannon	85	50	65	70	60	80	75	60	85
	Mauzy	50	55	60	60	70	65	75	60	85
	Marshall	60	50	65	60	70	65	75	60	85
	Bedford	60	50	65	60	70	65	75	60	85
H Cumberland Table- land.	Giles	60	50	65	60	70	65	75	60	85
	Lincoln	60	50	65	60	70	65	75	60	85
	Moore	65	60	50	65	60	70	45	50	80
	Scott	65	50	75	80	75	50	80	90	85
	Pentress	60	70	70	75	45	50	55	35	85
	Morgan	90	75	95	95	95	90	85	90	90
	Cumberland	90	70	90	80	80	80	50	85	85
	Van Buren	90	70	90	80	80	80	50	85	85
	Grundy	90	70	90	80	80	80	50	85	85
	Land	90	70	90	80	80	80	50	85	85

AUGUST CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Cotton—condition.	Millet—condition.	Corn—condition.	Tobacco—condition.	Stock Peas— condition.	Sweet Potatoes— condition.	Sorghum—condition.	Tomatoes—condition.	Peanuts—condition.	Clover—condition.	Live Stock— condition.	Alfalfa—condition.
J Cumberland Table- land and Valley of East Tennessee.	Claiborne	..	..	..	..	..	..	..	..	..	..	..	..
	Campbell	..	50	55	..	60	65	65	70	70	65	85	..
	Anderson	..	60	55	..	55	50	50	50	..	50	85	..
	Khea	..	65	65	..	70	70	65	80	..	75	90	..
	Bledsoe	..	80	45	70	70	80	80	80	80	80	80	..
	Sequatchie	..	..	80	..	85	100	75	75	..	65	75	..
	Marion	..	..	..	..	..	..	..	..	..	..	..	..
	Hamilton	..	..	..	..	..	..	..	..	..	..	..	..
	Sullivan	..	50	65	..	50	50	..	75	..	50	75	..
	Hawkins	..	65	60	80	75	75	75	70	..	75	80	..
K East Tennessee Valley.	Hancock	..	65	40	75	60	75	75	40	..	75	80	..
	Washington	..	80	70	100	80	95	80	85	..	85	90	..
	Hamblen	..	50	50	..	45	70	75	60	..	50	80	85
	Grainger	..	60	50	..	60	60	60	55	..	60	85	..
	Union	..	50	50	60	40	50	55	60	..	35	75	60
	Jefferson	..	..	35	..	50	50	60	40	..	20	60	75
	Knox	..	..	50	..	35	65	25	40	..	85	80	70
	Roane	..	85	75	..	60	75	85	70	..	65	90	..
	Loudon	..	..	..	..	..	..	..	..	..	..	..	..
	McMinn	80	75	50	..	70	60	75	75	..	60	80	60
L Valley of East Tennessee and Unaka Region.	Meigs	..	80	75	..	100	90	80	80	..	60	85	..
	Bradley	..	75	50	..	70	75	75	70	..	70	70	80
	James	..	..	..	..	..	..	..	..	..	..	..	..
	Johnson	..	75	80	60	80	70	80	70	..	90	100	..
	Carter	..	85	80	..	75	95	80	90	..	85	80	85
	Unicoi	..	..	..	..	..	..	..	..	..	..	..	..
	Greene	..	75	75	75	75	90	85	80	..	70	90	70
	Cocke	..	55	55	55	50	50	55	50	..	55	75	75
	Sevier	..	80	70	50	75	65	75	80	80	65	80	80
	Blount	..	70	50	70	60	80	80	45	70	60	85	90
	Monroe	100	60	70	80	65	50	85	70	80	70	90	100
	Polk	65	55	50	..	55	60	60	80	75	50	85	..
	State average	81	65	63	69	67	71	72	68	77	58	84	80

TENNESSEE AGRICULTURE

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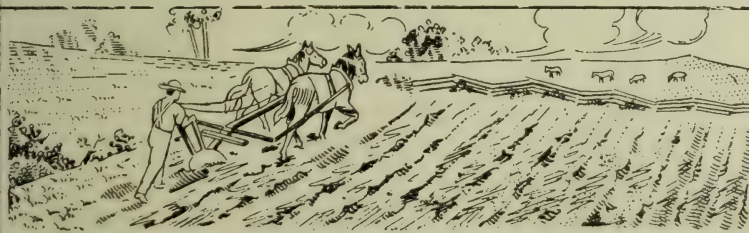
IN THIS ISSUE:

West Tennessee Farmers' Institute.

Lessons of the State Fair.

Selecting Seed Corn. Profit in Hogs.

August Crop Report.



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A Magazine Devoted to the Conservation and Development of the
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THOMAS F. PECK, Commissioner

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OCTOBER 1, 1913.

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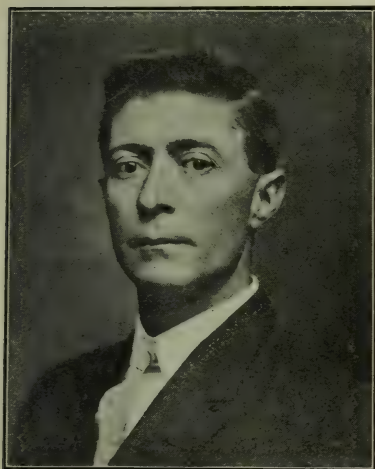
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WEST TENNESSEE FARMERS' INSTITUTE.

R. T. DeBERRY,
President West Tennessee Institute.

More than 1,500 farmers attended the sessions of the West Tennessee Farmers' Institute at Jackson, on September 3, 4 and 5. The meetings of the institute were held in the auditorium of the Jackson High School, and were presided over by the President of the institute, Hon. R. T. DeBerry, Assistant Commissioner of Agriculture for West Tennessee. The Secretary, Jo D. Johnson, of Jackson, was at his desk.

The convention was called to order at 9:30 o'clock by President DeBerry, and after prayer the ad-

dress of welcome was extended to the delegates by Col. R. S. Fletcher, of Jackson. Col. Fletcher spoke in a very happy vein, telling the farmers that they had many things to be thankful for, not the least of which was the fertile soil of their State, its fine live stock and the glorious history of the State. Col. Fletcher paid a compliment to Capt. T. F. Peck, Commissioner of Agriculture, who, he said, had given the people of the State the best administration of the affairs of the Department of Agriculture in its history.

COMMISSIONER PECK.

Commissioner Peck was introduced and responded to the address of welcome as follows:

It gives me great pleasure to respond to the address of welcome that we, as are among our friends; among people who are progressive enough to appreciate farmers, have just listened to. The enthusiastic welcome assures us that we the importance of agriculture to the prosperity of all the people.

The city of Jackson is situated in and mainly dependent upon the agriculture of the surrounding country for the prosperity of the city, and just in proportion to the prosperity of the farmers will be the prosperity of the city of Jackson.

It is encouraging to see the enthusiastic interest and willingness to cooperate in our meetings here to make them a success. I am much gratified to see more of the spirit of cooperation. I have heard a few business men (not in Jackson) say that they were not farmers; that they were not interested in agriculture. I was sorry for them, because I knew that on the prosperity of the farmers depended their prosperity in a large measure.

THE RELATION OF OTHER FACTORS TO FARMING.

Now, Mr. Businessman, professional man or manufacturer, to be interested in the development of the agriculture of your section does not mean that you should change your vocation. We want you to go on with the work you are doing, but you can lend us valuable cooperation in encouraging better educational



facilities for the farmer boys and girls; you can encourage the building of better roads. You can encourage community cooperation among the farmers in the improvement of live stock. You can assist in the dissemination of the vast amount of information that has been worked out by the experiment stations and scientific farmers. We have many farmers who need this information presented to them in a practical way so that they can understand and apply on their farms. You can do much to encourage the farmers to take more pride in his vocation. You can do much to encourage and help him in providing a market for his farm products, and you can do so without detriment to your own business or profession.

Brother farmers, the arrangements made for this meeting and the welcome we have received shows that the people of Jackson are interested in us and willing to lend us what aid and encouragement in their power.

THE FARMER'S OPPORTUNITIES.

Now what about ourselves? Are we doing all we can do to make the most of our opportunities? Are we cooperating among ourselves in our several communities as we should? Have we done all we know how to do and can do to build up our soils, improve our live stock, improve the quality of our farm products? I do not think any one will claim that all of us have, with all the evidence of depleted soils, poor quality of live stock and poor quality of farm products offered on the markets. We owe it to ourselves and our families to do the best we can; to intelligently put in practice the knowledge we have. When we fail to do so, we are cheating ourselves worse than anyone else.

We know that the successful business man, manufacturer or professional man loses no opportunity to advance his interest by profiting by everything that will help him. Why should we not do so? I know that we are not altogether to blame for being slow to accept everything that has been offered us. I know that in the past farmers have been afflicted with theorists and dreamers who have theorized about farming and offered the farmers many impracticable suggestions that they had too much sense to listen to or attempt to put in practice. I know, too, that many scientists who knew what they were talking about and the principles they advocated were good and could be put in practice by farmers whose training was equal to their own, but the way they were presented to the majority

of farmers had a tendency to drive them further away from scientific methods because the suggestions were out of reach of the majority of farmers. But that is getting to be a thing of the past. Those engaged in the dissemination of scientific information to the farmer have learned that they must present their information in a practical way so that the farmer can understand and put in practice on his own farm with equipment that he can afford to own and operate.

They are also learning another lesson that has proved very valuable and that is to take up some of the simple, essential things first that the farmers can do, and when he does, the good results encourage him to do more. There is one mistake too many of us make. We try to climb hills before we come to them. We lose sight of the things we know how to do and can do trying to solve problems that we are not ready for.

THE SOIL PARAMOUNT POINT.

We know that the soil is the farmer's capital and on the fertility of his soil depends largely his crops and profits. The soil should be the first thing for the farmer to understand; how to make available the plant food in his soil and how to increase its fertility. Some farmers who have cropped their soils from year to year, taking everything off and returning nothing, when their crops fall off until there is no profit, get a notion into their heads that they can have their soils analyzed and have a fertilizer mixed for them that will furnish all the needed elements of plant food so that by applying that fertilizer to their lands they should grow bumper crops. They are doomed to disappointment. The chemist can tell the amount of plant food in a sample of soil, but he cannot tell how much of it is in available form for plant food and another sample twenty feet away would in all probability show a very different amount of plant food.

What the farmer wants to know how to do is to know how to make available the plant food that is in his soil. This he can do by deep plowing in the fall, turning under vegetable matter, subsoiling, keeping a cover crop on in winter, good drainage for low grounds, and thoroughly pulverizing his soil in preparing his seed bed. Then stirring the surface after planting often and thorough enough to kill all weeds and grass seed as fast as they germinate. This will form a dust mulch and prevent evaporation of moisture needed for the growth of the crops.

TO TREAT SOIL.

As the crop grows and matures under the right kind of preparation and cultivation the farmer can tell by looking at the crop if it is deficient in nitrogen by the light green instead of a rich dark green color. If deficient in phosphoric acid and potash, by the grain and stalk. If deficient in nitrogen, he can get that from the air by growing soy beans, peas or clover and turning under. He will find when he subsoils his ground and adds vegetable matter to improve the mechanical condition of his soil so that the air, frost and water can penetrate it and disintegrate his broken up subsoil, he will have made available a liberal amount of plant food that was locked up in his subsoil. It is easier or at least cheaper for him to go about increasing the fertility of his soil in this way than by buying fertilizers.

We should remember that except in alluvial soils the subsoil differs from the loose top soil only in the vegetable matter that has been added to the top

soil. If we want to restore our soil to its virgin fertility, we have only to follow nature's plan. Break up the hardpan, subsoil and add vegetable matter to improve its mechanical condition so that the rain, air and frost can penetrate it and unlock the mineral plant food so generously provided by an all-wise Providence.

Humus is absolutely essential to soil fertility and you do not get it in appreciable quantities in commercial fertilizers. If you are going to use commercial fertilizers, and many times under right conditions you can do so at a good profit, remember that the better mechanical condition you can get your soil in, the better results you will get from your fertilizers. Do not complain at your fertilizer dealer for poor crops if when you plow in the fall of the year you turn up undissolved fertilizer in your soil. The fault is your own. To get the plant food in fertilizer for your crops your soil must be thoroughly pulverized and have moisture in it to dissolve the fertilizer so that the roots of the plant can take it up in the form of sap.

MORE LIVE STOCK.

There are many of the simple essential things I would like to talk to you about in connection with the soil and its improvement, but I cannot take the time now. I may tell you at another time or in another way, but there is a final word I want to say about keeping up the soil and that is to keep more *live stock*. The fundamental principle in maintaining soil fertility is in cultivating the soil to grow crops, to feed animals to feed the soil, thus completing the agricultural cycle, a law of nature that cannot be violated without paying the penalty of depleted soils and decreased crop production. My brother farmers, do not neglect your soil. It is your capital. I hope the simple suggestions I have offered may be of value to you. We have splendid soils in Tennessee that will not disappoint us if we treat them right.

HOME MAKERS' SECTION.

Mrs. G. H. Robertson, of Jackson, in her welcome address to the Home-Makers' Section of the Institute, spoke as follows:

It is a great pleasure to welcome you to our city; it is more than a pleasure, it is a privilege to open the doors of Jackson to you, the builders of our country homes, for you bring to us more than we are able to give to you.

Jackson is the hub of West Tennessee and has grown to be quite a railroad center, as well as an educational one. We are proud to show you her paved streets and public buildings, her shops and factories; and can offer you to drink the best water in the land. Most of all do we value our experiment station. There is no more important duty than that of teaching to our youth the secrets of the soil; and to inculcate in them a reverence for the sacred science of agriculture is to begin to build the "perfect state" that we all dream of.

A SACRED SCIENCE.

The science of agriculture is, as I have said, a sacred science. We in cities and towns do artificial work, live artificial lives—you a life near to nature's heart. We change your products—make the grain into flour, the cotton into cloth, your timber into furniture; the turn of wheels and the clatter of machinery

do our work; while you, forming a holy alliance with Nature's mysterious agents—the earth, the air, the sun and rain—wait in partnership with God himself for the tiny blade to shoot up from mother earth and the ear to grow full, the fields to change from green to gold and the fruit to ripen and fall from the tree. A man's life dedicated to work like this must indeed take on many qualities of the divine.

Agriculture is a sacred science. And it is indeed fitting, my dear women, that you should be a part of this convention, for was it not woman who founded the science?

WOMAN AS HOME-BUILDER.

Harking back by either the historic road or the scientific one, we come to the fact that woman founded both agriculture and domestic science. How when the race was barely emerging from the animal state woman, feeling the palpitation of a new life beneath her heart, sought the protection of a cave: knowing that the child soon to become a separate life from her own would need food she gathered roots and seed from the forest and planted near the entrance of the cave. This was the first farm life, and was made by woman while man still roamed the woods meeting the wild beast in bodily combat or searching smaller animals for food which he ate selfishly, thinking naught of the being he had helped to create.

EVOLUTION OF FARM LIFE.

This was a mere semblance of the farm life we have today, for the evolution of the farm is a beautiful story. Woman finding the floor of the cave hard for baby feet wove a carpet of rushes and soon began to hang about its wall bright flowers and berries from the wood that the eye of the child might be gladdened. And from this crude attempt the modern home will all its luxury and comfort has grown—another interesting story which, of course, you take up in your domestic science discussions. My social work has led me into many kinds of homes—homes of direst poverty and homes of wealth, homes of criminals and homes where virtue predominated, and often it has been hard to draw the line, for “there is much good in the worst of us, and much bad in the best of us.” But of one thing I am convinced: We must look to our country homes for the perfect home life.

CHILD REARING.

Child rearing is the chief, perhaps the only legitimate, excuse for the creation of a home. It is to the country home that we must look for our substantial citizens. It is a source of inspiration to all lives to have lived the early years heart to heart with Nature. One of our most versatile writers says that if he shuts himself in his study to write upon any topic, ethical, political, social or industrial, he must first mentally transport himself to the country home of his childhood and hear again the song of the birds, the rustle of the leaves, feel the cool brook upon bare feet, climb the apple trees and smack his lips over the luscious fruit that has never since tasted half so good, then he is ready to stand on the side of Truth and solve any of the complex problems of today with a clear vision.

THE COUNTRY HOME.

Thank all that is holy for the country home. From it will come our leaders.

Do you recall how Amos, one of our prophets, reared on an oasis in a desert, laid bare with a loud voice its follies and vices, the shallow, wasteful lives of its men and women? He having time for meditation and observance of the real things of life had developed a great soul, a soul that saw beneath convention and fashion and was not bound by fear of outraging them. And he tells us simply how the message came to him, "I was a feeder of flocks and a gatherer of sycamore fruit and the Lord said unto me, 'Prophesy.'" Such is often the conversion of the prophet.

THE ORIGIN OF LEADERS.

It is you, the mothers in the country homes, that will produce our leaders; and yet you will not be capable of "bending the tender twig" in the direction you wish if you remain always within the four walls of your homes. You must study social, political and industrial conditions of cities and States if you would succeed as a mother and home-builder; you, though you dwell in the country homes surrounded by the gifts of God, are a part of the great complex mechanism of the world. The perfect home builder is the one whose sphere is limited only by the boundaries of our planet. The fact that you may get many articles of food and clothing from the cities makes it absolutely necessary for the well being of your family that you know under what circumstances they are manufactured. Many cases of diphtheria and lung trouble that perplex us may be traced to the city sweat shops, where girls and children work in badly ventilated dens day and night; many cases of typhoid come into our homes from polluted water within a stone's throw of the country home. It is necessary then that we come together, we mothers and home-builders in conventions and assemblies, that we each bring our problems to a common point where we may formulate laws and work to place them on our statute books and then work harder to keep them there. The game of righteousness is a strenuous one but one worth the playing.

Speaking of motherhood let us look for an instant upon our perfect mother Mary, the mother of our Leader, Jesus. She was a student and sympathizer of the human race. Her mind dwelt upon the injustice of our social and industrial life and in her exaltation over the coming leader she exclaims, "the mighty in their pride shall be laid low, the hungry shall be fed with good things and the rich go empty away;" this shows her clear idea of the proper adjustment of conditions. Poverty is as distressing in the rural districts as in the city slums. It is on account of our unjust social, political and industrial conditions that each State needs a leader, one that shall carry the white banner of right aloft for the guidance of the multitude, one who shall be willing to wear the crown of thorns of criticism and condemnation as well as the wealth of roses of triumph, one who can rally around them the forces of righteousness, and loyal to Truth win a victory over impure politics and social injustice.

If you, my dear women, are to form these leaders, you have a great task before you, a great and joyous task. You have much to teach these leaders in the time to come; for we are entering upon a new era.

Mrs. M. E. Utterbach, President of the Home-Makers' Section, responded briefly to the welcome address, stating that the women of the convention fully appreciated the honor and privilege that had been

bestowed upon them as accredited delegates to the convention. She told of a farmer who had tried to get along without a wife, who would come to the West Tennessee Institute and make other trips, leaving the care of the household and farm to his servants, but he soon discovered the error of his way and took unto himself a wife. Mrs. Utterbach stated that it was the duty of every farmer's wife to try to make the home brighter and better and to assist her husband in every way possible in his daily tasks. Mrs. Utterbach's very practical talk was heard with much interest and was sincerely appreciated, as indicated by the applause.

Secretary J. D. Johnson delivered a brief address in which he welcomed the corn club boys who were in attendance. He also stated that the Merchants' and Manufacturers' Association of Jackson had made arrangements for conveying the farmers to and from the West Tennessee experimental station.

PROF. MORGAN SPEAKS.

Prof. H. A. Morgan of the Department of Agriculture, University of Tennessee, delivered a very striking address on "European Methods of Farming." He stated that he recently returned from a tour of the farming sections of Europe and found that the farmers of the "old country" were more practical than the American farmer. They not only believe and preach the rotation of crops, but they practice it all the time, stated Prof. Morgan. "The rotation of crops is very important to West Tennesseans," he said, "and I admonish you farmers to do more of it than you have been doing."

"The second point I wish to make about the European farmer is that he has more live stock than he has acres of land. The third point is this: there are many small farms there and intensive farming is carried on with a great degree of success.

"The fourth point is this: the European farmer uses fertilizer to immense advantage.

"The fifth point is: the use of legumes and the turning under of the vegetable matter."

Elaborating on these points, Prof. Morgan urged upon the farmers of West Tennessee to profit by what they had heard and learned of the methods of the successful European farmer.

The President announced the appointment of the following committees:

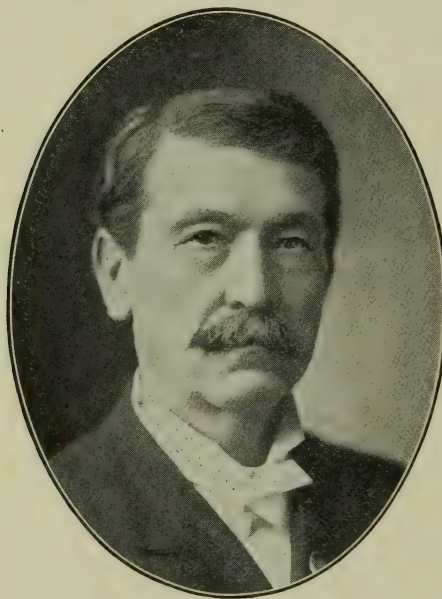
Committee on Courtesies.—J. W. Purviance, Chairman, McNairy

County; J. W. Berry, Henderson County; Dr. McRee, Obion County; L. C. James, Gibson County; F. P. Kyle, Fayette County.

Committee on Resolutions.—H. P. Keller, Chairman, Lauderdale County; G. N. Price, Dyer County; W. F. Bell, Hardin County; W. H. Dowdy, Benton County; W. D. Brasfield, Weakley County.

COL. ROBERT GATES.

At Thursday morning's session of the Institute Mr. D. G. Hudson read the address of Col. Robert Gates to the farmers, which was as follows:



"I have not been able to prepare the address I contemplated to present to this institute, but I will take occasion to briefly call your attention to two things of importance, especially so to the farming interest—the interest that always first feels the bad results of demagogic legislation and agitation.

"First, I call your attention to the recent amendment to the National Arbitration Act, which provides that the grievances of employers representing railroad organizations may be considered as well as the grievances of the employe. This looks like a check in the radical progress of arbitrary regulation and one-sided consideration of issues affecting railroads. Until recently the tendency upon the part of the government has been to listen to only one side of the controversy—that of the employe. Now, if the act was further

amended so as to open the door of arbitration to both sides of the controversy, upon application of either party, then a spirit of fairness would be established that has not heretofore existed.

"Regulation, State and National, and legislation in favor of labor organizations without regard for the interest of others has about reached the limit of sanity and safety, and the familiar 'booger bear,' government ownership, looms up menacingly. The truth is, there is comparatively only a State and National, as now enforced, and government control in full which would mean National ownership—an immense, if not fatal, stride toward Socialism. Of all the isms of modern agitation Socialism menaces the farmer more dangerously than any other, for it not only means government supervision along all lines of activity, but the destruction of home—the reservoir of patriotism.

"Secondly, we have congratulated ourselves for years on the state of peace and good feeling existing between the people and the railroads in Tennessee.

While our sister States around us have been reaping the costly fruits of agitation, lawsuits and uncertainties, Tennessee has been at peace, and the people and the railroads in this State have been in cordial cooperation in developing the primary interests of the State. In this good work the railroads have not been stinted in the matter of cost of service. Every educational move made by the Department of Agriculture of this State has been liberally seconded by the railroads. Why shouldn't the railroads cooperate with the Agricultural Department? The interest of the farmer and the interest of the railroads are so interwoven that you can't help one without helping the other. Good results of the farming and live stock interest, the educational interest and the good road movement throughout the entire State. In spite of the fiercest and bitterest factional agitation along political lines dishonest schemes have been resorted to to get an advantage of the one over the other, and the unfavorable impression the political conditions in this State has made abroad and the farming interest of this State has prospered to a high state of development. Besides extravagance, the result of factionalism run mad, Tennessee has escaped many of the burdens that her sister States are suffering from by the demagogic war of politicians on railroad corporations.

"While this is all true, I regret to say to you that there are signs and evidences of a serious attempt to disturb the peaceful and profitable relations existing between the railroads and the people in this State, and to foist upon the people a bitter and costly agitation from which many States are suffering. A few gentlemen in office, and some who are seeking office, seem to feel that their only chance to succeed is through excitement of prejudice, appeals to ignorance, the magnifying of small mistakes, misrepresentations and reckless assertions directed at the greatest and most important, the most helpful and liberal of the State's great interests, the railroads. They are dealing in 'old bird nests,' long-settled issues and digging down into the depths for something on which they may use the muck rake. They need an issue, and an issue they must have. The old issues upon which they have worked threaten to break from under them. Like Richard III, they would give a kingdom for a horse, but I venture the prediction that if they get a horse it will be a wooden one.

"It is a matter of current report that several of the large cities of this State have combined to control the next Legislature. These cities are boss-ridden, or will be, it is expected, and one of their purposes is to build up their respective cities at the expense of the railroads and the country communities: first, by throwing sand in the eyes of the farmer, then by changing the taxing laws that give the country counties their fair proportion of the railroad taxes. Under the present law all the railroads, including sidings, yards and terminals, are assessed as a whole and then distributed amongst the counties according to the number of miles of main line in each county. They propose to so change the law as to assess everything belonging to the railroads off of the fifty-foot right of way as localized property, thus increasing the revenues of Shelby, Davidson and the other large counties, and decreasing the revenues of the small counties.

"It will be a sad day for Tennessee when the city bosses, like those in New York and Pennsylvania, rule in legislation. The farmer has everything to lose and nothing to gain by this political movement of the city bosses.

Though physically weak, I could not resist the impulse to present these

things to the farmers of this State. I am so profoundly impressed with the danger to the farming interest and the farming class by alliances sought to be made by special interests and in the triumph of this city movement that I could not refrain from presenting this paper with its facts and its warnings. It is the life as well as the glory of the farmers of this State that they stand as the peacemakers between warring interests. So long as this proud attitude is maintained by the great parent body of the republic the country will be safe."

Mr. Roberts, Director of the West Tennessee experiment station, delivered an interesting talk on the cultivation of crops.

Thomas A. Early, of Memphis, and Prof. R. L. Bynum, of Jackson, made appeals to the Institute for support of the proposed Knapp School of Country Life.

Dr. H. H. Shoulders, of the State Board of Health, made an interesting and instructive address on sanitation.

ELECTION OF OFFICERS.

At the morning session of Thursday the Institute went into the election of officers. R. T. DeBerry, of Humboldt, Assistant Commissioner of Agriculture for West Tennessee, was re-elected President for the ensuing year; E. S. Dowdy, of Shelby County, was elected First Vice-President; F. D. Kyle, of Fayette County, Second Vice-President; and E. D. Ledbetter, of Hardin County, Third Vice-President. J. D. Johnson, of Madison County, Secretary of the organization for the past twelve years, was re-elected to that position.

BOYS' CORN CLUB.

An interesting feature of the Institute was the meeting on Thursday of the Boys' Corn Clubs. This meeting was in charge of J. R. Fewell, of Nashville, agent of the United States Department of Agriculture, in charge of Boys' Corn Club work in Tennessee. The welcome address at this meeting was delivered by Mann McCalla, of Shelby County, President of the Boys' Corn Clubs of West Tennessee. During the course of his address he told how he had sold this year eighty bushels of corn for \$2.50 per bushel. He praised the work the club was doing among the farm boys of the State and urged those present to give more of their time to the work.

Prof. S. V. Bright, of the State Normal School at Memphis, addressed the boys on the cultivation of corn. Short talks were made by others.

Mann McCalla, of Shelby County, was re-elected President of the Boys' Corn Clubs; Sherman Argo was elected Vice-President, and

Harry Wilson, of Henry County, was elected Secretary and Treasurer.

During the afternoon the delegates to the farmers' institute went to the experiment station, where they were given further lectures and shown practical methods.

At the morning session on Friday Prof. H. S. Nichols delivered an instructive address on farm demonstration work. A. L. Garrison, of the State Department of Agriculture, made a talk on the value of the feed and seed laws of the State to the farmers. Dr. J. S. Ward, State Apiarist, made a talk on the bee industry of the State.

RESOLUTIONS.

The Committee on Courtesies reported the following resolutions, which were adopted unanimously:

We, your Committee on Courtesies, extended on account of the Jackson meeting to the large body to which the West Tennessee Farmers' Institute has grown, beg to submit the following:

We appreciate the fact that the railroads have not only continuously co-operated with the farmers of West Tennessee and the State Department of Agriculture in perpetuating our organization, but our history shows that to the farsightedness of Colonel Robert Gates, industrial and immigration agent for the L. & N. R. R., we owe our existence as a body, born fourteen years ago, and now annually coming together in increasing magnitude and with a future of limitless possibilities before us. The railroads are entitled to, and have, the thanks of the entire membership of our body for their cooperation with West Tennessee farmers in the matters which most nearly concern their material welfare.

To the city of Jackson we feel grateful for the arduous advance work necessary to be done in order to house and otherwise care for the delegates and visitors to this institute. Jackson evidently believes in growing in grace, for we are constrained to say that the institute of 1913 has been better cared for than was ever done before. Not only have good houses been provided for our increased number of delegates, but in giving us the use of the superb city high school auditorium without money and without price. Jackson graciously tendered us her best, and did it with a wholeheartedness in keeping with her long established Southern hospitality.

To Commissioner Thomas F. Peck we would throw a bouquet made of the best things the farmer and stock raiser can say, and would then feel that justice had hardly been done his splendid efforts to bring our urban population to realization of their value in the making of Tennessee. Commissioner Peck has so ably and efficiently served the people that improved agriculture in every county is a tribute to the efforts of himself and co-workers, among whom we rate Professor H. A. Morgan and others as unexcelled in their respective lines.

The country press in publishing weekly the letters on practical subjects by Commissioner Peck has done inestimable service to the people and we believe has reached the people in a way that has never been effected by other means.

R. T. DeBerry, our President of a year, has acquitted himself with honor,

showing himself not only able to preside in a level-headed manner, but a man who stands for a square deal to all. As Assistant Commissioner of Agriculture for West Tennessee President DeBerry has given his whole time to the work and good results have followed his administration.

To our Honorable Secretary, Joseph D. Johnson, we would say, "Well done, thou good and faithful servant," and so far as this committee is concerned the office of Secretary may be made one for life, for surely none could better fill it than does Secretary Johnson. We are impressed with the fact that either as a volunteer or a conscript our Secretary makes a good soldier and from him we shall expect his continued efficient service until we shall place him with honor on the superannuated pension roll.

We are especially proud of our Home-Makers' Section which has been added to our body. In this, as in all things, we must look to the women for the best our country can be, and we urge that the work of our women be in every way amplified and extended. To these good women we must look for the boys who are becoming such valued aids in scientific agriculture, and to the boys themselves for future farmers who are to set their profession in the place it belongs—ahead of all others.

The following report by the Committee on Resolutions was unanimously adopted:

To the Chairman and Officers of the West Tennessee Farmers' Institute now in Session at Jackson, Tenn., September 3, 4 and 5:

We, your Committee on Resolutions, beg leave to submit the following:

Whereas, there has been no record presented to this body by the Secretary of this convention, nor has there been any record kept for several years so far as this committee is informed; therefore

Be it resolved, That the Secretary must keep a record of all business transacted for each day of the meeting held now and hereafter.

Resolved, That said minutes shall be read and approved by the convention and signed by the President and Secretary of said meeting the next morning, and that the last day's meeting shall be read and approved as aforesaid before adjournment of said convention.

Resolved, That the Secretary procure a set of books and keep the records of all proceedings of each meeting therein.

Resolved, That we urge upon our Secretary to get the minutes of all the proceedings of the previous meetings as far back as possible and place on record in this order.

Resolved, That we further urge upon our Secretary to procure a copy of the by-laws that was passed by this convention last year and have printed for distribution at the next convention or when applied for.

Whereas, It has been very inconvenient and expensive for a number of our delegates to visit the experiment farm; and

Whereas, a number of people from all over West Tennessee and other sections visit our experiment farm at different seasons of the year; and

Whereas, It is very expensive to these people to get transportation to the

experiment farm, we, therefore, recommend that the President and Secretary of our convention be requested to see the street railway company and the authorities of Jackson, Tenn., to have them extend the street railway line out to the experiment farm.

Be it further resolved, That we extend our sincere thanks to the Board of Education of Jackson, Tenn., for the use of the auditorium of the High School Building, and, also, the citizens of Jackson for the hospitality shown us while in the city.

The Institute then adjourned sine die.

THE LESSONS OF THE STATE FAIR.

The 1913 Tennessee State Fair is now history. It was a success and taught many valuable lessons, not only to the visitors, but to the fair management as well. As the masses of our farmers get out of the ruts they are waking up to the fact that they are facing conditions entirely different from the conditions their fathers worked under; that if they succeed they must adjust themselves to meet present day conditions and problems.

To do so they must understand their soil and how to make it more productive; they must appreciate the value of live stock on the farm and the difference in profit between the scrub and the thoroughbred.

When the farmer is aroused to appreciative interest in his land, crops and live stock he wants to compare notes with his brother farmers—at first at the county fairs, and as his confidence in his ability and his products increases he wants to enter competition with farmers from all over the State, and later he may grow until he is willing to compete in a national way.

With the broader development of agriculture will come a modification in the plans for State and county fairs. In the past the entertainment and amusement features have been the prominent ones. The race horse has overshadowed the draft horse, the dairy and beef animals. Agricultural products were minor features.

The trotting horse will always have a place at the fairs, but that place will be just in proportion to his importance in developing the agricultural wealth of the State. The awakened farmer will be looking for information as well as entertainment and amusement. The different breeds of beef cattle, of sheep, hogs, horses and dairy cattle will demand much of his attention; so will the various exhibits of farm products. He will want to know more about types of corn, wheat, rye, oats and grasses.

The educational features of the fair will take up more of his time

and attention and he will have less to devote to entertainment and amusement.

The State Fair is first an educational institution. It should and will be the clearing house for progressive agriculture, and the 1914 fair is going to be planned on lines that will appeal to the producers of Tennessee upon whom we are all dependent for prosperity.

The plans now formulating and to be announced early in December contemplate getting closer to and helping the individual live stock raiser to enter the competition without being outclassed by the professional exhibitors. This will apply with equal force to the individual competitor with his farm products.

The Tennessee State Fair is intended primarily to develop the agricultural interests of Tennessee, and not merely having a big display of professional exhibitors. The management expects to have every Tennessean feel that the State Fair is our fair and participate in the advantages it makes possible.

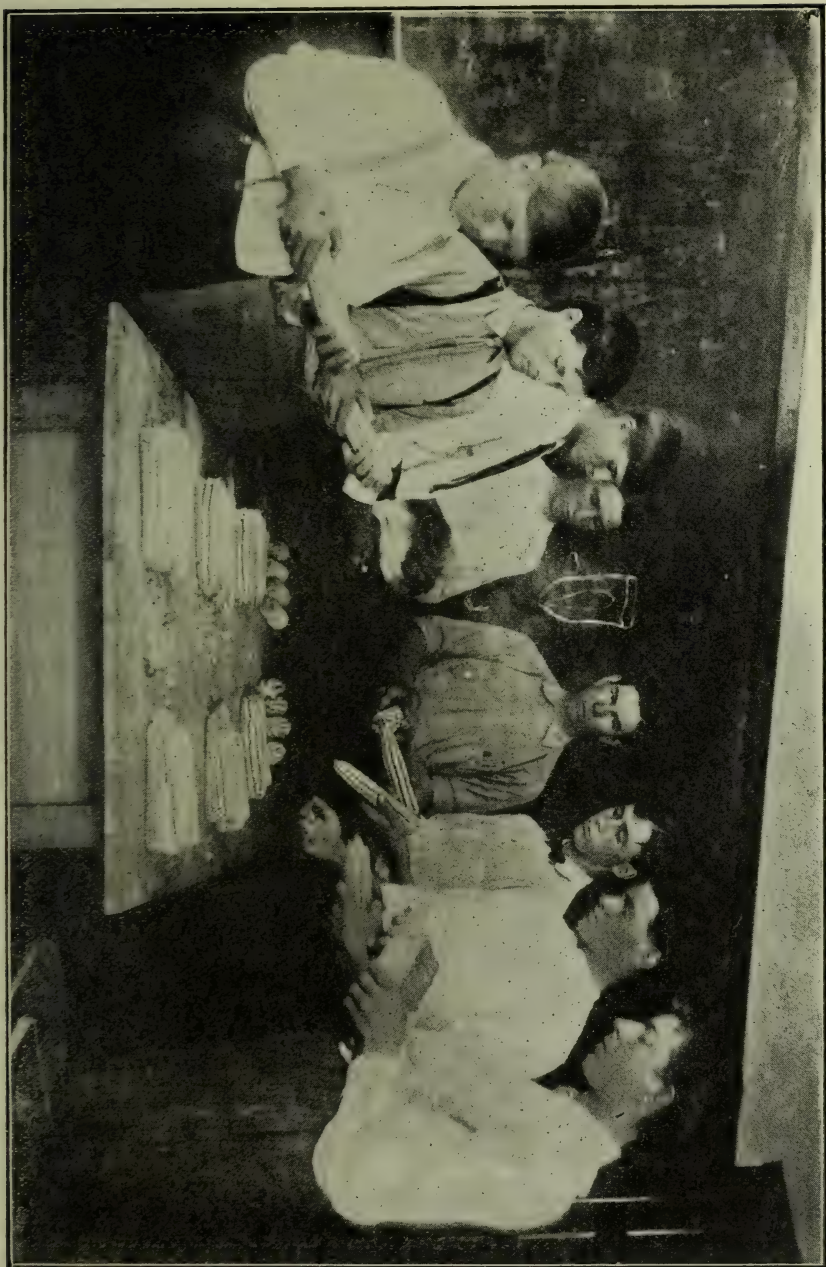
Those who attended the fair just closed could not fail to note the development of the practical educational features. Among them the farm boys' encampment, exhibits of work done by boys and girls in the various schools, the great improvement in character and quality of agricultural exhibits.

Next year we are going to have a great increase in exhibits of Tennessee live stock. We want you, brother farmer, to get in line to have a part in the 1914 fair. It is going to be a real Tennessee fair, and if you are not a part of it, it will be your own fault, because we are going to give you every opportunity. Do not wait until late next year, but make up your mind *now* that you are going to be one of the prize winners at the Tennessee State Fair for 1914. You can if you get in real earnest about it.

GREEN ALFALFA.

German experimenters found that green alfalfa put into an un-walled pit in July and taken out in March had decreased in weight by practically 33 1-3 per cent. The outer layers were more or less moldy, and in some places the silage was partially charred.

Beet leaves and tops siloed in the stock on the ground in October contained 6,556 kilograms of dry matter, and about 5,222 kilograms at the end of January. Corn stover silage made in an iron concrete silo suffered only a slight loss in nutriment, as shown by experiments, and this loss was offset by increased palatability, something which always counts for much.



Corn Judging, Hixon High School, Hamilton County.

SELECT YOUR SEED CORN NOW.

BY T. F. PECK.

A proclamation was recently issued by the Governor of Minnesota setting aside one whole week as Seed Corn Week, during which he advised every farmer to drop all other work and give his attention solely to the selection of seed ears of corn for next year's crop, and preparing it for keeping until next planting time. This on the theory that the corn crop of next year is made by selecting the seed this year.

Farmers were advised to go carefully through their corn fields and select specimen ears to save for seed, and not to trust any of the old methods where care and judgment cannot be exercised. The farmer is also advised to put in next spring a special seed patch, separate from the main field, giving it special cultivation, selecting from that patch in the fall the seed for the coming year. All of which is excellent advice, and if the farmers of Minnesota heed their Governor and observe Seed Corn Week the corn yield of that State will be much larger the next and succeeding year than it was this year.

This advice to the farmers of Minnesota is also applicable to the farmers of Tennessee. If, by careful seed selection and proper cultivation, the corn fields of Tennessee can be made to produce only five more bushels per acre next year than they do in a year of average production it would mean an increase in production for the State of something like 25,000,000 bushels of corn, which would be worth, even in a year of bountiful crops, at least \$13,000,000. Think of what that would mean to the State, then think how easily it can be accomplished.

If a farmer had fifty acres in corn, it would mean to him an increase in production of 250 bushels. This five-bushel increase is small compared to what is possible through careful seed selection, proper preparation of the soil and proper cultivation. If the farmer will be more careful in the selection of his seed corn, he will be glad of it as long as he grows corn.

Last year the average yield of the State of Tennessee was less than twenty-five bushels of corn to the acre. It should be at least fifty bushels, as it is on some of the best farms of the State, and as it can easily be made on the others. The factors necessary to increase the yield of corn in this State are: better quality of seed corn, increased fertility of the land through rotation of crops and use of manures, and a thorough preparation of the ground and a better system of cultivation.

No attempt will be made in this article to go into the ways of testing seed corn. That will be touched on in a future article. It requires no technical knowledge to select the best developed ears, those that are well filled at both ends. Now is the time to begin the selection of seed corn for next spring. It has been the slipshod custom of many farmers to either get their seed corn from the crib after the winter feeding, or else get it from some neighbor who probably takes it from the same source.

Now is the time for the farmers of Tennessee to begin their seed corn selection. A good way is, when gathering the corn, to have a box or barrel in the wagon, and into this put every ear of more than ordinary good size and shape. Later this can be gone over again and a thorough examination made, discarding those that show any defects. This is an easy method and is much better than taking what is left in the crib at planting time. However, if you will go into the field before the crop is harvested and select the ears with care, you will be more likely to get the best than you would be if you waited until the rush and hurry that come with harvesting.

This is a matter that should be attended to by every farmer who intends to raise corn next year. It will be one of the best investments of his time he can make, and if this advice is generally heeded the corn production of Tennessee will be increased next year by many million bushels.

COMMON SENSE IN THE POULTRY YARD.

It is a mistake to keep late-hatched pullets of the large varieties for winter layers. These are always the late moulters. A hen changes her coat at the same time each year.

If convenient, separate the fowls into several bunches. They will lay more eggs than if crowded together in one house. For instance, if a hundred hens are kept, divide into four or five flocks and have a separate house or apartment for each flock.

Don't forget to store plenty of cabbage for the hens. They take the place of grass better than anything else with the exception of green rye. In case the cabbage crop is a failure then by all means sow a patch of rye in the fall.

Save all the turnips, rutabagas, pumpkins, etc., that can be conveniently stored for winter poultry food. They may be fed either cooked or raw. Cooked vegetables, of course, should be mashed and thickened with ground grain. Always remove the seed from pumpkins.

PROFIT IN GOOD HOGS.

BY T. F. PECK.

The better and larger breeds of hogs are a reliable and dependable source of profit to the farmer with a few acres as well as to the one who owns and operates the large farms of the State, and this is especially true now that there has been found a way to prevent the spread of hog cholera, that scourge that has cost the State of Tennessee, as well as other States, so many million dollars.

It will be well for the farmers of Tennessee to look into this branch of the live stock industry now that the General Assembly of the State has provided for the erection and maintenance of a plant for the manufacture and distribution of anti-hog-cholera serum. This plant is to be operated under the direction of the Department of Agriculture, with Dr. George R. White, State Veterinarian, in charge, and work will begin on the erection of this plant just as soon as the money is available.

There is a shortage of meats that is world-wide at the present time, and prices are therefore good. The shortage is such that cannot soon be overcome, and with the adaptability of this State to live stock production, its farmers should be in position to reap the benefit of the good prices that are sure to obtain for many years to come. It is time for the Tennessee farmer to take advantage of his opportunities in the way of meat production.

In raising hogs for the market, or for his own meat, the farmer should use the breeds that make the better, bigger and thriftier animal. It is hard to understand why some farmers are opposed to getting rid of the mongrel breeds. The hog that is capable of turning corn and slops and good pasture grasses quickly into pork is the variety every farmer should have.

It will be well to understand in this connection that the man who buys his hogs and his feed will not make much in the transaction. The hog raiser should grow his own feed, and he should breed his own animals. If you have hogs of the run-down, wornout breed, get rid of them. Stringy, razor-backed animals will eat as much feed as the better breeds. Get a good boar for yourself if you can; if not able to do that, buy one in partnership with two or three of your neighbors. Buy a few good sows if you have none, and give some consideration to pasturage. Keep the boar and the sow and the young pigs out of the horse lot and give them a chance to grow.

Hog raising ought to be as much a part of farming operations as

is the growing of crops. We ought to grow all the hogs that can be economically fed. The hog is a mortgage-lifter and a bank roll fatterer, and I would repeat again that the farmers of this State should give this industry more attention.

ROOM IN THE SOUTH.

There is room in the South for eight times as many people as we now have, according to the estimate made by Senator Hoke Smith, of Georgia. Were the population in the nine Southern States—Kentucky, Tennessee, Virginia, South Carolina, Alabama, North Carolina, Georgia, Mississippi and Florida—as dense as it is in the nine Northern States—Rhode Island, Massachusetts, New Jersey, Connecticut, New York, Pennsylvania, Maryland, Ohio and Delaware—the Southern States could support the whole population of the United States, approximately 92,000,000.

This great section is calling.

There is no section in particular which does not offer opportunity for young men and young women to prosper. Here can be found all the modern comforts and conveniences of life alongside of virgin soil and untouched fields of business.

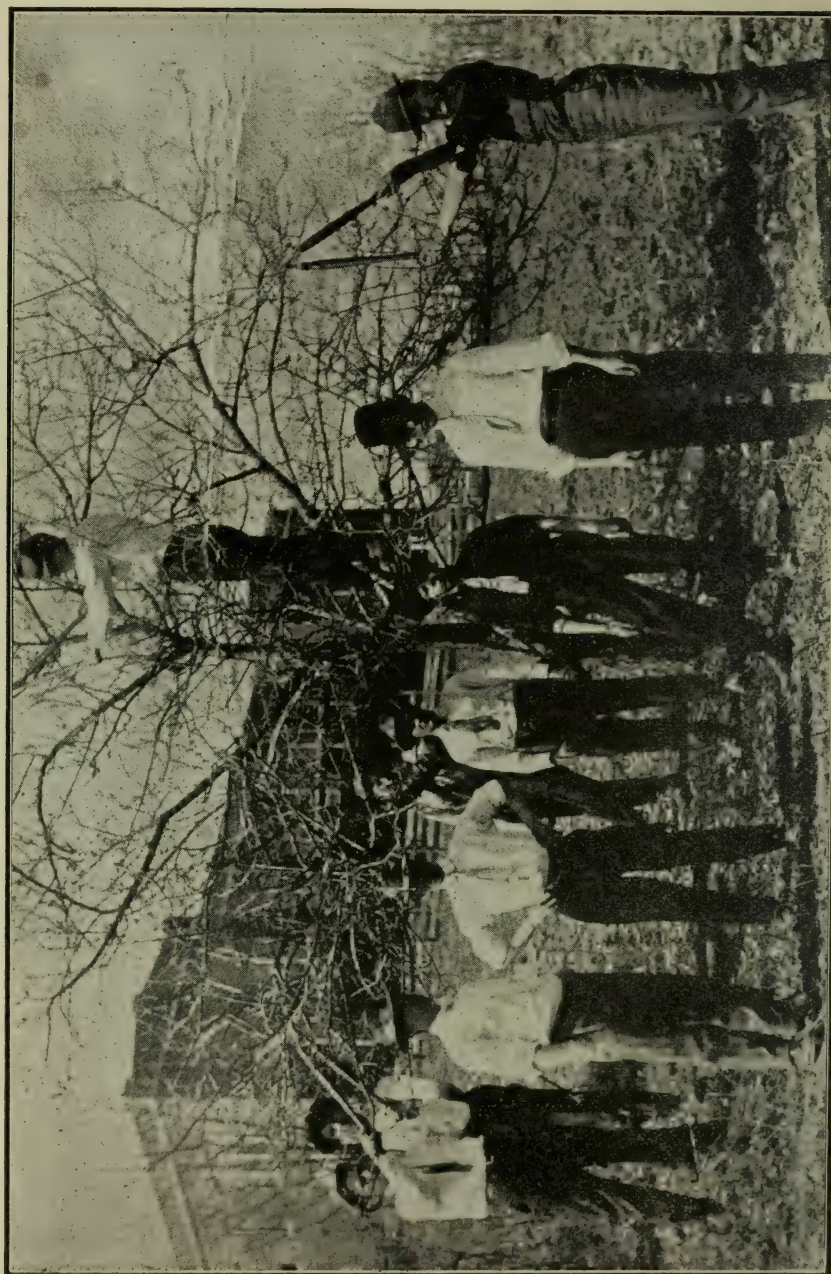
It is unbelievable that ambitious, energetic young people would remain in the overcrowded regions of the Northeast if they could be made to realize the unlimited opportunities that await them in Tennessee and other Southern States. Tennessee could provide homes for eight times as many people as we now have. Ten million people could come to this State and still we would not be crowded.

We have yet to learn of a Northern farmer coming to Tennessee and locating and then regretting his venture. Invariably Northern or Western farmers have prospered in Tennessee. Some of our most substantial citizens are people who have come to us from other States.

With this vast room for more people, it is strange indeed that the tide of immigration has been so long turning in this direction. But it has turned and reports of passenger traffic on Southern railroads would indicate that the number of people coming South to settle is increasing each year.

There is room in the South, and the South is calling.

The small farmer can keep a variety of live stock sufficient to produce something to sell and bring in a bit of ready cash every month in the year.



Agriculture Class, Hixon High School, Hamilton County.

STAY RIGHT HERE.

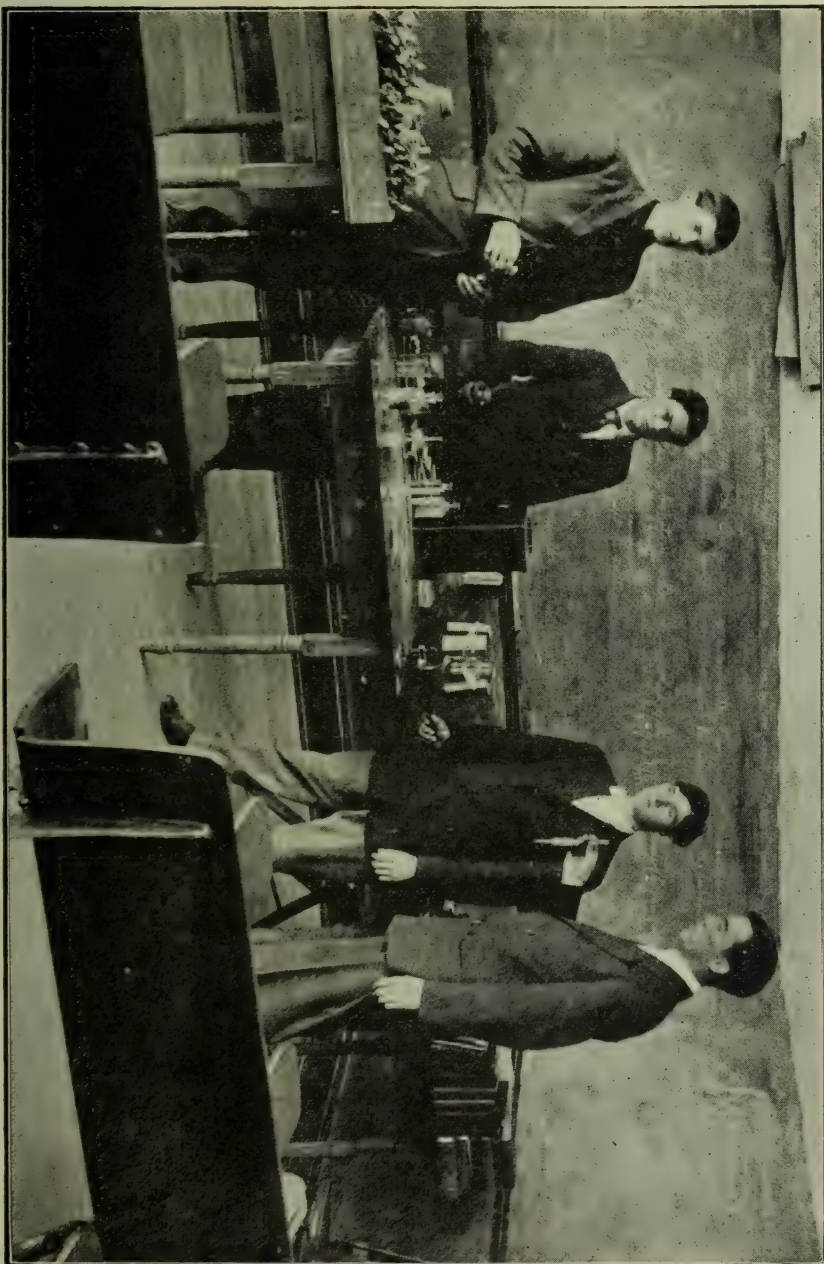
If the people of Tennessee would realize just what they have in the way of soil and climate and atmospheric conditions, they would never seek to wander from their own firesides, but would be content to remain at home. The same may be said of Arkansas and Mississippi, and, in fact, of the entire valley. The climate alone is a valuable asset. An observant gentleman, who has traveled extensively throughout the country, and visited the Canadian Northwest, is not enamored of that section, and does not consider it even remotely equal to this section of the country. We hear of hundreds of thousands of Americans and millions of dollars going over into Canada, into Saskatchewan, Alberta and other provinces, but these are usually the farmers from our Northwest, who hail from the cold countries of Northern Europe, and who see better opportunities in Canada to obtain homes than are offered in this country. The Canadian government has been most astute in handling its public lands. There are no land speculators permitted. Lands may be obtained by tillers of the soil who will go upon them and develop them, and by none others. Town lot companies have been put out of business, and the government will sell a town lot only to the one who wants to build on it. The newcomer who wants a piece of farming land is shown a map in the government office, upon which all the lands are laid off, and the prices for the same fixed according to the fertility of the soil and other advantages. The purchaser may buy this land in twenty equal annual payments, and after the first payment is made the government will advance him money with which to build a shelter for himself and his stock. In this way a man of limited means may become possessed of a good farm. But his troubles do not end here. The country is most inhospitable. There are practically nine months of winter. While the crops are bountiful, the wheat crop is a failure on an average of one time out of every three years. Cattle must dig under the snow to find food, where the dead grasses lie concealed, just as the reindeer in Lapland do, and for months and months throughout the winter they never taste water, depending on snow for liquid nourishment. Many of them perish, and all get through the winter and begin the spring as starvelings. When the grass springs up in profusion it contains so much water and so little nourishment that cattle can barely exist on it, and fare no better than they did upon the dead grasses of winter. In the fall when the grasses have some substance and body, of course, they fatten rapidly, but the cattle raising industry is not a profitable one. To those who live in this salubrious climate it will be almost incredible to hear

that it is practically impossible to raise chickens in that country. They freeze to death unless taken under shelter where there is artificial heat, and this is not profitable. There is no fruit raised there excepting the hardy raspberry. The cereals can be raised in abundance, and there are some vegetables that grow in great profusion, but as a whole life is hard, and the food supply is limited and circumscribed, unless supplemented and amplified by canned goods from the more temperate regions. Compare that country, with its Borean blasts and biting blizzards that drive the pulverized snow into buildings in spite of all that can be done, to this section where two and three crops of most articles may be raised, and where all the substantial of the Northern climate and all the delicacies of the tropics may be had in abundance, and with limited labor and no suffering from cold, and no one will be disposed to leave home to brave the terrors of the Northwest. If people would work to produce in this section as they are compelled to exert themselves to keep from freezing to death in the extreme North, they would be more prosperous than any other people on the face of the earth, because they have the climate and the soil and the length of the season, which enables them to produce almost everything that grows. The surface of the earth is pretty well taken up, and cheap lands on very easy payments are most alluring, but there are other considerations which should make this section of the country more attractive.—*Memphis News-Scimitar*.

SUCCESS.

A prize was won for this definition of success, and it is a good one: "He has achieved success who has lived well, laughed often and loved much, who has gained the respect of intelligent men and the love of little children; who has filled his niche and accomplished his task; who has left the world better than he found it whether by an improved poppy, a perfect poem or an improved soul; who has never lacked appreciation of earth's beauty or failed to express it; who has always looked for the best in others and given the best he had; whose life was an inspiration, whose death was a benediction."

A glass-front poultry house causes extremes in temperature, warming up in the day time and then turning cold with the setting of the sun. This is also apt to cause disease and make the fowls' combs and wattles more sensitive to frosts. The open muslin front is by far the best and at the same time the least expensive. Some glass may be used, but not exclusively.



Agriculture Class, Hixon High School, Hamilton County, Testing Milk.

COTTON GINNED TO SEPTEMBER 25.

Following is the report of cotton ginned in this State up to September 25, 1913, as compared with the same period in 1912:

COUNTY	CROP	
	1913	1912
Carroll	428	....
Chester	303	9
Crockett	983	50
Dyer	1,311	73
Fayette	945	23
Gibson	1,017	61
Giles	156	....
Hardeman	576	21
Hardin	481	....
Haywood	1,240	15
Henderson	338	....
Lake	1,512	147
Lauderdale	1,701	101
Lawrence	23	....
Lincoln	341	7
McNairy	390	5
Madison	1,009	24
Obion	454	....
Rutherford	370	1
Shelby	2,277	274
Tipton	2,369	179
All other	135	....
TOTAL	18,359	990

THE ADVANTAGE OF EDUCATION TO A FARMER.

Slowly but surely the farmer is coming to the front as the most necessary and most important factor in the material prosperity of the great human family and with the realization that upon the proper development of the world's agricultural resources rests its future, the conviction has come that the farmers of the future must be educated.

In a recent issue of the *Irish Homestead*, its editor, G. W. E. Russell, says:

"The modern farm must be looked upon as a chemical factory where, by the most varied and perfect processes known to science, raw materials—useless in their existing form for human food—are turned into the most important of all products, that is, into human food. In all other chemical factories whose produce is of far less importance to the human race than are the food products of the farm, it

would be looked upon as almost criminal folly to put such a factory in charge of an uneducated man who knew nothing of the scientific nature of the processes the raw material went through and worked only by antiquated rough and ready rule of thumb. The farmer, who nowadays is in the position of manager to a chemical factory, must be a highly trained scientist, whose training is supplemented by sound practical experience."

Every farmer who has visited an agricultural experiment station and seen corn, cotton, clover, etc., growing side by side in the same field with only a few feet between the crops that grow upon land fertilized according to the chemical needs of each individual crop, and the same crops upon land not so fertilized, is bound to see the advantage of understanding how a farmer can secure the best results.

The agricultural training that a child now gets in our public schools lays the foundations of an education that to the future farmer is of far more importance than classics or higher mathematics.

If he is not able to supplement the knowledge thus acquired by a higher course in agriculture it will enable him, by visiting experiment stations, attending farmers' institutes and taking a good agricultural paper to operate his own "chemical factory," as Mr. Russell calls a farm, to the best advantage as by practical application of what he learned at school, at institutes and from demonstration work and from his agricultural paper, any intelligent man can become a high-class farmer and can make his land yield to its full capacity.

When the educated farmer becomes the "rule" and the uneducated farmer the "exception" in America, we as a nation may look fearlessly forward, for the future of our country will be safe.—*Jackson Sun*.

AUGUST CROP REPORT.

The Department of Agriculture received reports from crop correspondents in only seventy-seven counties for the month of September. These reports substantially bear out the reports for August as to the probable corn yield in the State, indicating that the crop will be less than two-thirds of the normal production.

The figures given in the comparative table are probably deceptive as to cotton, because of the fact that in some of the counties where the staple is not generally produced, the condition of the crop is not as good as it is in the large cotton producing counties of the State. Reports from the counties where cotton is one of the principal crops would indicate that the production will be as good or better than for 1912.

The same thing may be said in regard to tobacco. The counties producing the bulk of the dark tobacco grown in the State will have about as good a crop as last year.

Stock peas do not show as well as last year, and peanuts will show about the average yield for the state. Young clover has been badly damaged by the dry weather.

Except for hog cholera, live stock in the State is in good condition. Farmers are taking a greater interest in the better breeds of live stock, and are finding this a profitable industry at the present prices.

Obion County reports rains during the middle of September, but that young clover is all dead. Dyer County reports crops badly damaged by the drouth. Lauderdale reports the drouth broken, but too late for most of the crops.

Weakley County reports the drouth broken during the middle of September, with good slow rains, and that cotton picking has begun. In Madison County the pastures are reported very dry, with cotton 60 per cent open.

In Haywood County the report is that the dry weather has damaged crops to a large extent. In the vicinity of Whiteville, Harde-man County, early corn is reported as excellent, while late corn will show less than half a crop. Rain is interfering some with picking cotton. Fayette County reports cotton deteriorated about 20 per cent since last report.

Carroll County reports prospects for a better corn crop than last year, while the cotton crop is reported damaged one-third, and young clover nearly all dead. In Henderson County the drouth was severe, and breaking of land for wheat delayed. Chester County reports cotton damaged by late rains. All crops are reported short in Stewart County. In Benton the drouth damaged the cotton, and the yield will be materially reduced. Clover and meadows are reported burned out in Houston County, and Humphreys County reports very severe damage from drouth.

In Decatur County it is reported that no rain fell from August 15 to September 7, and all crops injured. In Montgomery County frequent light rains made an improvement in tobacco and pastures. In Robertson it is reported that early corn will turn out better than expected, and late tobacco is helped by rains.

Young clover is reported ruined in Cheatham County; early tobacco is in the barns; pastures are all dried up. The drouth has been

severe in Lewis and Cannon. Late corn in Lawrence is reported helped by rains. An improved condition is noted in the corn in Overton County, while dry weather is noted as continuing in Jackson and Putnam. Recent rains have helped late corn in White. In Coffee County only one good rain was reported from the time corn was planted until September 15.

Pastures show an improvement in Sumner County as the result of good showers. Early corn is good in Smith County, while the late corn is said to be a practical failure. Davidson and Wilson report pastures as badly damaged by the drouth. Marshall and Bedford Counties also report very severe damage. In Giles the crops are reported as reduced about one-half.

Morgan, Van Buren and Campbell Counties report prospects for less than two-thirds of a crop of corn. Anderson, Rhea and Bledsoe say about half a crop. Sequatchie, Hawkins and Hancock report the worst drouth since 1881. Washington County notes an improved condition in corn from late rains. Hamblen and Grainger report the drouth broken by light rains.

Roane County reported a good rain on the 19th of September, the first since June. McMinn County reports the pastures burned and the corn crop nearly a failure. Johnson, Carter and Greene Counties report a half crop or less. Continued drouth has ruined young clover in Blount County.

Indications for the whole State are that the corn crop will be little better than half a normal yield. Tobacco will show a decreased production, and Irish potatoes a large falling off in the yield. Very great damage has been done to pastures and young clover.

Below is the summary, for comparison, of the reports of this Department for September, 1912, and 1913:

	1912.	1913.
Cotton, condition.....	70	67
Millet, condition.....	..	64
Corn, condition.....	77	61
Tobacco, condition.....	85	68
Stock peas, condition.....	82	64
Sweet potatoes, condition.....	..	65
Sorghum, condition.....	..	71
Tomatoes, condition.....	..	66
Peanuts, condition.....	76	78
Clover, condition.....	77	56
Live stock, condition.....	89	87
Alfalfa, condition.....	84	76

SEPTEMBER CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Cotton—condition.	Millet—condition.	Corn—condition.	Tobacco—condition.	Stock Peas— condition.	Sweet Potatoes— condition.	Sorghum—condition.	Tomatoes—condition.	Peanuts—condition.	Clover—condition.	Live Stock— condition.	Alfalfa—vondition.
A Alluvial Plain of the Mississippi River and Plateau Slope of West Tennessee.	Lake	70	...	65	65	90	85	95	90	85	...	95	85
	Obion	60	...	60	...	90	80	90	90	85	40	90	...
	Dyer	75	85	90	100	90	85	80	85	85	80	80	90
	Lauderdale	75	...	85	...	80	80	95	90	...	75	90	85
	Tipton	80	85	100	...	100	100	90	90	80	85	100	...
	Shelby	...	...	...	...	...	...	...	...	...	...	...	...
B Brown Loam Ta- blelands, Middle Counties of West Tennessee.	Weakley	70	75	75	80	80	80	75	60	65	65	90	...
	Gibson	...	...	...	...	...	...	...	...	...	...	...	...
	Crockett	80	95	85	100	90	100	100	95	...	90	85	100
	Madison	70	...	75	...	80	80	70	...	50	...	80	...
	Haywood	70	...	100	...	100	80	100	100	20	...	90	...
	Hardeman	75	...	90	...	95	95	85	80	...	...	95	...
C Summit Region of Watershed, West Tennessee.	Fayette	...	...	...	...	...	...	...	...	...	...	...	...
	Henry	65	...	65	60	70	75	70	75	...	65	90	...
	Carroll	55	60	55	60	65	65	75	75	60	60	75	...
	Henderson	50	65	60	70	75	70	80	75	65	90	90	50
	Chester	60	75	60	...	55	...	85	...	...	55	80	...
	McNairy	70	65	85	...	95	80	80	85	...	90	90	90
D Valley of Tennes- see River, West and Middle Tennessee.	Stewart	...	50	40	60	40	25	50	...	60	...	90	...
	Benton	45	...	65	...	65	65	60	60	...	...	90	...
	Houston	...	75	40	65	75	65	50	50	...	...	75	65
	Humphreys	...	40	25	45	60	30	35	20	60	40	90	...
	Decatur	60	80	85	...	85	70	85	85	70	60	75	...
	Perry	...	20	65	...	75	60	60	75	80	20	90	...
	Hardin	50	50	75	...	50	...	80	40	...	50	75	...

E
Highland Rim of
Middle Tennessee,
Western Subdivision.

Montgomery	...	50	60	85	75	80	60	50	...	60	90	90
Robertson	...	60	65	60	75	75	80	70	...	75	90	...
Cheatham	...	...	65	50	65	45	60	...	...	20	65	...
Dickson	...	65	60	60	55	50	60	50	...	60	75	...
Hickman	...	75	65	85	75	50	80	65	70	...	85	...
Lewis	...	85	65	50	...	50	50	65	...	90	50	...
Wayne	...	75	60	...	50	50	90	...	75	50	75	...
Lawrence	...	...	...	...	...	...	...	...	...	...	...	...
Macon	...	20	50	40	30	20	20	25	40	30	90	...
Clay	...	50	45	25	25	30	80	50	...	25	95	...
Pickett	...	...	...	...	...	...	...	...	...	...	...	...
Overton	...	90	90	...	50	75	90	100	...	50	70	...
Jackson	...	40	50	60	40	30	25	40	...	40	85	...
Putnam	...	50	60	40	65	40	40	...	...	65	75	...
Dekalb	...	...	...	...	...	...	...	...	...	...	...	...
White	...	85	80	80	75	70	55	60	70	65	90	80
Warren	...	...	80	65	60	50	75	...	...	75	80	...
Coffee	...	80	60	85	80	85	85	90	90	80	95	85
Franklin	...	70	40	60	20	15	30	40	...	30	65	55
Sumner	...	80	55	75	80	65	80	70	85	80	85	75
Trousdale	...	...	...	...	...	...	...	...	...	...	...	...
Smith	...	75	50	75	85	70	70	75	...	80	100	...
Davidson	...	70	50	40	70	60	60	40	...	30	80	30
Wilson	...	75	45	...	40	30	35	25	...	15	95	75
Williamson	...	65	50	...	50	25	75	50	...	...	75	...
Rutherford	...	...	...	...	...	...	...	...	...	...	...	...
Cannon	...	...	...	...	...	...	...	...	...	...	...	...
Maury	...	...	40	...	50	90	50	...	...	...	80	...
Marshall	...	35	25	35	50	35	85	50	75	...	75	...
Bedford	...	...	50	...	25	50	40	...	10	90	...	...
Giles	...	60	55	65	50	65	60	80	80	45	90	85
Lincoln	...	...	...	...	...	...	...	...	...	...	...	...
Moore	...	...	50	...	45	...	25	...	...	45	80	...
Scott	...	...	...	...	...	...	...	...	...	...	...	...
Fentress	...	...	...	...	...	...	...	...	...	...	...	...
Morgan	...	60	60	60	75	75	75	75	...	...	90	...
Cumberland	...	...	...	...	...	...	...	...	...	...	...	...
Van Buren	...	75	50	...	50	80	80	75	...	...	100	...
Grundy	...	...	...	...	...	...	...	...	...	...	...	...

G
Central Basin.

H
Cumberland Table-
land.

SEPTEMBER CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.											
	Cotton—condition.	Millet—condition.	Corn—condition.	Tobacco—condition.	Stock Peas— condition.	Sweet Potatoes— condition.	Sorghum—condition.	Tomatoes—condition.	Peanuts—condition.	Clover—condition.	Live Stock— condition.	Alfalfa—condition.
J Cumberland Table- land and Valley of East Tennessee.	Claiborne	..	60	40	40	50	65	50	..	50	90	..
	Campbell	..	80	50	80	50	50	50	..	75	100	..
	Anderson	..	50	40	50	50	25	10	..	10	100	..
	Rhea, .....	..	..	60	30	60	60	30	..	60	90	..
	Bledsoe	..	60	45	100	100	100	75	80	20	90	70
	Sequatchie	..	50	75	80	75	75	75	..	35	80	..
	Marion	..	..	..	..	..	..	..	..	..	..	..
	Hamilton	..	55	50	40	70	70	75	..	50	85	80
	Sullivan	..	..	..	..	..	..	..	..	..	..	..
	Hawkins	..	50	50	50	40	40	40	60	..	50	100
K East Tennessee Valley.	Hancock	..	50	50	75	50	75	50	..	50	100	..
	Washington	..	65	60	60	85	85	70	..	85	95	..
	Hamblen	..	..	50	60	60	75	75	..	50	80	..
	Grainger	..	80	75	65	70	95	70	..	75	90	..
	Union	..	60	50	..	50	50	..	..	..	80	..
	Jefferson	..	75	50	75	..	75	..	..	50	100	..
	Knox	..	75	50	..	20	75	50	..	..	100	..
	Roane	..	70	85	80	60	90	65	..	40	100	60
	Loudon	..	50	50	40	50	50	60	..	50	75	..
	McMinn	60	80	50	55	60	70	80	..	..	85	..
L Valley of East Tennessee and Unaka Region.	Meigs	..	60	50	60	65	60	50	..	50	90	..
	Bradley	..	..	..	..	..	..	..	..	..	..	..
	James	..	..	..	..	..	..	..	..	..	..	..
	Johnson	..	..	75	..	..	100	100	..	100	100	..
	Carter	..	80	65	90	90	80	85	..	80	90	85
	Unicoi	..	..	..	..	..	..	..	..	..	..	..
	Greene	..	80	75	75	75	80	85	..	70	85	..
	Cooke	..	75	55	75	80	50	60	75	..	60	80
	Sevier	..	..	55	45	60	45	80	..	60	90	..
	Blount	..	85	90	80	90	85	85	90	80	90	..
Total	Monroe	80	50	75	40	50	50	100	90	75	100	90
	Polk	..	50	65	80	60	90	100	50	100	100	75
	67	64	61	68	64	65	71	66	78	56	87	76

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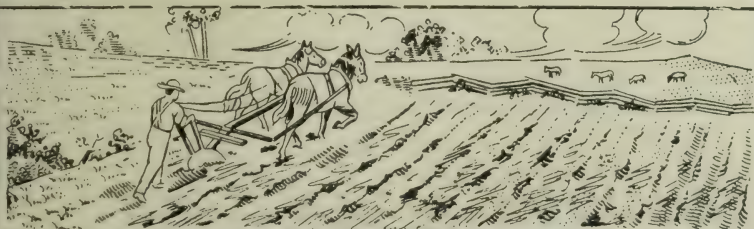
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IN THIS ISSUE:

Part I.
Hog Cholera.

Part II.
Anti-Hog-Cholera Serum Plant.

Part III.
Protective Vaccination.



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INTRODUCTION.

It was only a few years ago when no less than fifty-one counties in Tennessee were in rigid quarantine, both Federal and State, on account of the widespread prevalence of the Southern or Texas fever tick.

Not over five years ago that great scourge to the sheep-raising industry, "scab," invaded the flocks of the Volunteer State.

Unceasing warfare on the "tick" by the State and Federal Governments in cooperation with the county authorities eradicated the tick, and the State has been released from quarantine and the markets of the world opened up to our Tennessee-raised cattle. The day will never come again when our cattle owners will be called upon to sacrifice their cattle on account of either State or Federal restrictions against their free movement to market centers. One of the first official acts of the Department of Agriculture after the induction of Capt. Thos. F. Peck into the Commissioner's chair was a determined assault by State, Federal, and county authorities (eleven counties in Middle Tennessee) upon the sheep scab mite, and within as short a time as sixteen months our flocks were again free from "scab," and instead of Tennessee going into quarantine as was threatened, the markets of the world remained open to the sheep raisers of this State.

FUTURE POLICY OF THE DEPARTMENT.

Since Texas fever in cattle and "scab" in sheep have been eradicated, it now behooves us as loyal Tennesseans to make an assault upon that great scourge to our swine-raising industry—hog cholera. While this department will endeavor in every way possible to prevent the spread of, and eradicate, glanders, bovine tuberculosis, lump jaw, black leg, and other contagious and infectious diseases of animals, it shall be our purpose and policy for the next two years to wage unceasing warfare upon hog cholera, and most of our energy and effort will be devoted to the study, control and ultimate eradication of this one disease.

ANTI-HOG-CHOLERA SERUM PLANT.

In compliance with an Act of the Fifty-eighth General Assembly, we have caused to be erected and equipped an Anti-Hog-Cholera Serum Plant. This plant is located at 1502 Clinton Street, Nashville, Tennessee, and has been constructed according to modern sanitary and hygienic requirements. Experts who have visited and inspected this plant pronounce it complete and perfect in all its appointments. It has a capacity of 250 hyperimmunes, which are capable of yielding no less than 1,000,000 average doses of serum annually. The Dorset-Niles method will be employed in producing the serum.

Our object in publishing and distributing this illustrated Bulletin is to acquaint all Tennesseans with hog cholera in all its phases, and the facilities which have been placed at our disposal by the General Assembly for the purpose of combating the ravages of that great scourge to the swine industry in the Volunteer State.

Every swine owner and all other persons who are interested in the protection and development of the swine-raising industry, are cordially invited to visit this plant and become familiar with the methods here employed in the manufacture and use of anti-hog-cholera serum.

GEO. R. WHITE, M.D., D.V.S., *State Veterinarian*.

State Capitol, Nashville, Tenn., November 20, 1913.

PART I.—HOG CHOLERA.

I am often asked the question, What is hog cholera? About the best answer I am able to give at this time would be that hog cholera is an acute, subacute or chronic contagious disease of hogs caused by a filterable virus, the specific micro-organism ("germ") of which has never yet been isolated or described by any laboratory or field worker. It is characterized by extreme contagiousness and a high death rate, and does not affect any animal except swine.

ANNUAL LOSSES IN UNITED STATES FROM HOG CHOLERA.

Swine values in the United States total many thousand over one billion dollars. Authorities claim—and I believe justly so—that the annual losses from the ravages of cholera in this great country of ours amounts to between fifty and sixty million dollars. This is to us a tremendous drain in the way of actual losses. It is appalling when we pause to think that cholera is a preventable disease and one easily and cheaply controlled.

ANNUAL LOSSES IN TENNESSEE FROM HOG CHOLERA.

The 1910 Federal Census gives Tennessee 1,386,050 head of swine, valued at \$7,320,377.00. By what we consider a conservative estimate based upon reports of reliable and well-informed men from most every county in the State and from our own personal observation and other dependable sources of information, we have claimed, and do now state, that no less than 400,000 hogs, valued at \$2,250,000.00, died in Tennessee during the year 1912 from hog cholera.

THE INDIRECT LOSSES.

Any disease which causes such money losses in one year in a State as small in area as Tennessee certainly deserves the most careful consideration from all persons who are either directly or indirectly involved. With those 400,000 hogs that died last year from cholera made into bacon and lard some part of the present high cost of these two essentials to our existence would be solved. The control and eradication of hog cholera does not by any means involve or concern or affect the pocketbook of the swine owner alone, but every meat-consuming citizen has a share—from an economic viewpoint—in the success of such an undertaking. Since the price of pork and pork products is based upon supply and demand, it is logical to conclude that for every hog that dies from cholera there is one less hog with which to feed the people.

Two million two hundred and fifty thousand dollars represents only the direct annual losses. The indirect losses caused by discouragement of the swine-raising industry amounts to equally as much as the direct losses.

If cholera was not dreaded, it is quite probable that instead of only 1,386,050 head of swine, Tennessee would be producing at least 3,000,000 head. Many farmers who are now raising only a few hogs each year would raise many if cholera was not feared. I know of at least one breeder who stated to me that he had tried hard to raise two hundred hogs a year, and that "cholera wiped them out at least two years out of every five." Sometime ago he took it upon himself to investigate the efficiency of the Dorset-Niles Anti-Hog-Cholera Serum. After investigating, he was impressed with its merits and later stated that instead of trying to raise two hundred hogs a year he expected in the future to raise one thousand, and that he expected to make it a point to know that each one of them was an immune.

HISTORY OF THE DISEASE.

The first outbreak of hog cholera about which we have any authentic data occurred in the State of Ohio in the year 1833. Since that time it has spread to every State in the Union and throughout almost every European country. Its first occurrence in England was in 1862, where it has since appeared from year to year, causing in one year (1896) the loss of as high as 30 per cent of all swine in that country. It appeared in Sweden in 1887; Denmark in 1889, at which time it also made its first appearance in France. It reached Hungary in 1895. The losses in these foreign countries appear to be equally as heavy as those in the United States. There has been only a very few outbreaks of hog cholera in Canada, hence Canadian laws in regard to importation of swine from the United States are very rigid, as the authorities there hope by this means to prevent cholera gaining a foothold in Canada.

SUSCEPTIBILITY OF BREEDS.

Although some breeds have been lauded and advertised as being "*immuned to cholera*," I have no hesitancy in stating that all breeds are about equally susceptible, the "mule-foot hog" not excepted.

Pigs after weaning and young shoats are more susceptible than the older hogs.

Our old friend the "razor-back" is just as susceptible to cholera as is the Poland China, Berkshire, Hampshire, Duroc Jersey or Tamworth. No breed will withstand the onslaught of cholera infection.

MORTALITY.

In localities where the disease appears the first time the death rate will reach from 80 to 95 per cent.

In communities where cholera is more or less prevalent from year to year the death rate may be as low as 30 to 50 per cent. The disease is more fatal to young hogs and those kept in unsanitary surroundings.

PRESENT STATE REGULATIONS.

All swine owners should acquaint themselves with State regulations pertaining to hog cholera, which are as follows:

SEC. 30. That all public stock yards in the State are hereby placed in quarantine—as regards the handling of swine—and all persons firms or corporations are prohibited from removing swine therefrom for any purpose other than immediate slaughter.

“SEC. 31. Hogs infected with or exposed to cholera shall not run at large or be driven on ranges, commons or public roads; such hogs must be confined in strict quarantine. Carcasses of hogs that have died of cholera must be sent to a rendering tank, or completely burned on the premises.”

PERIOD OF INCUBATION.

The period of incubation, which means time from actually contracting the disease to time first symptoms or evidence of sickness appears, varies from four days to four weeks, depending upon the susceptibility of the individual animal and the virulence and manner of the infection.

An active or acute attack of sickness indicates that the period of incubation was short and the infection highly virulent. A chronic type of cholera is indicative of a long incubation period and an infection low in vitality. The period is usually from seven to fourteen days.

SYMPTOMS.

Since cholera occurs in three different forms—acute, subacute and chronic—the nature and character of the symptoms naturally vary to a very decided degree, even in individual animals belonging to the same herd.

At the beginning of an outbreak in a herd we usually observe only one or two animals showing evidence of sickness. There is nothing particularly characteristic in the signs of sickness displayed and the presence of so grave a disease as cholera may not be suspected until a week or two later when other hogs in the herd become sick. Of

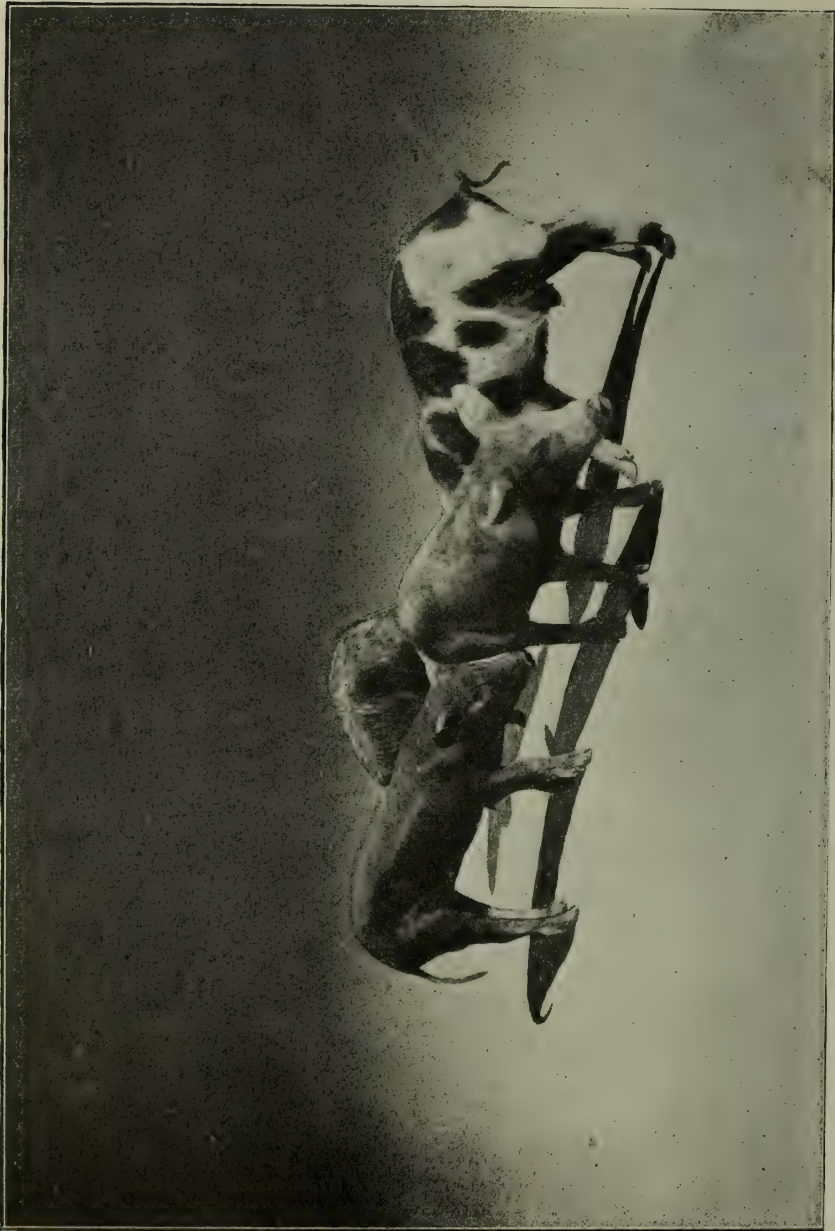


Fig. 1.—Group of Cholera Pigs.

course as the number of sick hogs increase there is an increase in the amount and virulence of the infection, hence increased opportunities are offered for the well animals to contract the disease.

Acute Form.—This is by far the most common type met with in field work. At the beginning the temperature is elevated from two to four degrees or even as high as six degrees. Since the normal temperature of a hog is 102 degrees, this would mean that in cholera cases the temperature would be 104 to 108 degrees. The temperature of a hog may be taken per rectum with an ordinary human thermometer, and above 104 degrees in cholera-infected herds would indicate sickness from cholera. On account of the high temperature, loss of appetite, lassitude and marked depression are among the first symptoms presented. Vomiting is frequent. Usually the hog strolls off from the remainder of the herd, selects a quiet place and lies down, sometimes hides by covering itself with litter such as leaves, straw, etc. The inflammation of the intestines and soreness in the abdominal walls causes arching of the back, tucking up in flanks, stiffness in hind quarters and loins, often causing a crossing of the hind legs when the animal moves about.

There is a muco-purulent secretion from eyelids which causes them to adhere together. Reddish blotches or spots oftentimes appear in the skin behind the ears, under the abdomen and neck. These skin lesions are particularly noticeable in hogs with light-colored skin. Constipation alternates with diarrhoea. The color of the feces depends upon the character of food which the hog has eaten. Thumps is a frequent symptom, so is quickened breathing and cough. As the disease progresses the symptoms become more well marked by the hog becoming extremely weak and depressed and finally death. The losses from acute cholera will vary from 50 to 75 per cent. However, those which survive an acute attack will go into the subacute and sometimes the chronic forms.

Subacute Form.—This is the form that the disease assumes after the animal has been sick for eight to twelve days. There is muscle soreness, dry skin, catarrhal discharge from eyes, watery bowel discharges, loss of appetite, cough, depression, etc.

Chronic Form.—When the animal lives from twenty to ninety days it is referred to as the chronic form.

Symptoms.—Irregular appetite, emaciation, weakness and general unthriftiness and indigestion. The inflamed reddish blotches and "spots" on the skin may become dry and hard, resulting in sloughing and sores. Sloughing of the tail and ears are by no means infrequent sequelae of hog cholera.

INTERNAL LESIONS YOU MAY EXPECT ON POST MORTEM EXAMINATION.

Whenever hogs have begun to die on a farm the owner should take immediate steps to diagnose the disease. The best method of diagnosis is to carefully examine the carcass for lesions of disease.

In hog cholera the following post mortem changes may be looked for. It must be remembered that all of these lesions may not be found in any one hog.

Skin.—Red or purple spots may be observed on the hairless parts of the body, especially in the skin of light-colored hogs. Look for these skin lesions under the belly, between the hams and behind the shoulders. In long standing or chronic cases the skin may crack and the ears and tails slough off.

Stomach.—Congestion on mucous lining, and haemorrhagic spots may be in evidence.

Lymphatic Glands.—Darkish red discoloration on the surface and haemorrhagic spots when these glands are cut into.

Large Intestines.—Haemorrhagic spots and congestion in mucous lining in acute and subacute form. Ulcers of various sizes and shapes in chronic form. These ulcers are diagnostic lesions of cholera, as in no other disease do they appear.

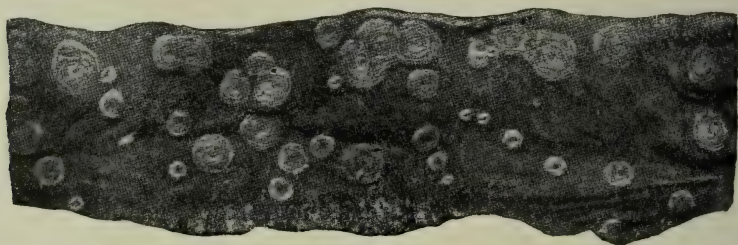


Fig. 2—Ulcers (Large Intestine) Chronic Form.

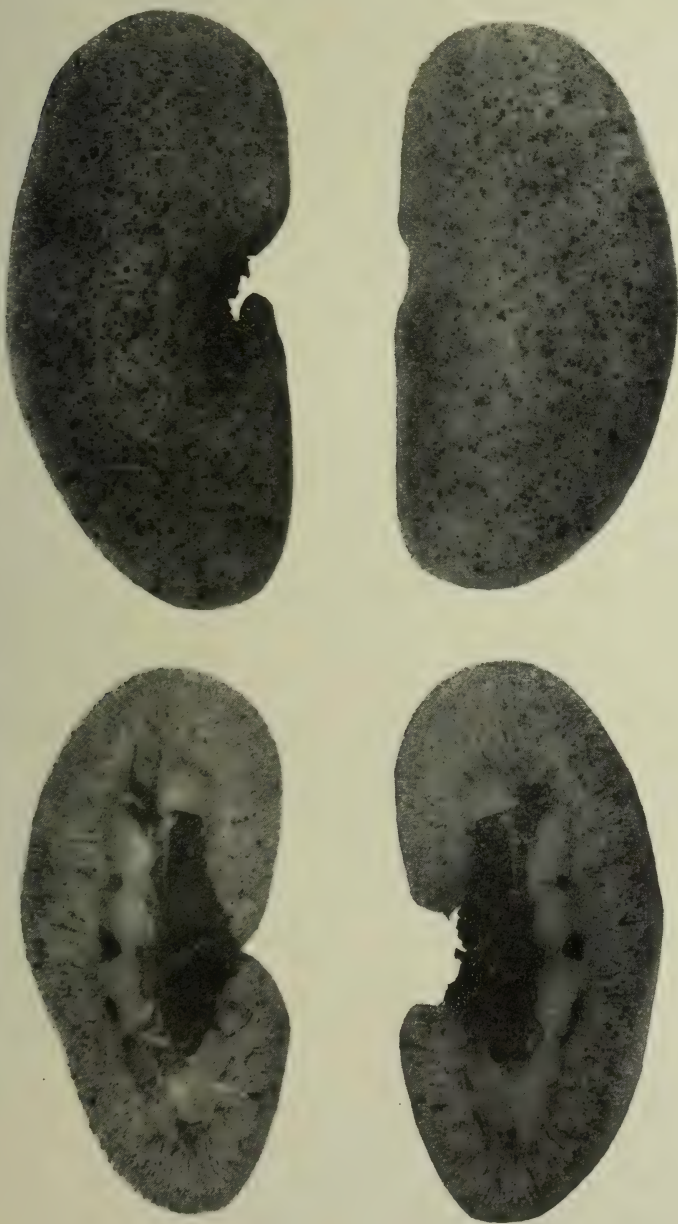


Fig. 3—"Button Ulcers" (Large Intestine) Chronic Form.

Small Intestines.—Changes here are extremely slight and not apparent to the casual observer in but a few exceptional cases.

Spleen.—Sometimes enlarged and discolored.

Fig. 4.—Kidney Lesions of Hog Cholera. Observe the speckled or spotted appearance.



Kidneys.—When the capsule (covering) of the kidney is removed by stripping, small dark red spots are observed. Sometimes these kidneys are as spotted or speckled as a turkey egg. The finding of spots of this character is pathognomonic evidence of hog cholera, as no other disease produces them.

Lungs.—Certain portions of the lobes of the lung may be discolored and solidified, not resembling in any particular the normal or healthy lung, which is light pink in color. The lung surface often presents haemorrhagic spots and congested areas varying in size from a pinhead to a dollar. In chronic cases pus may form and the lungs may be adhered to the chest walls.

The kidney, lung, and gland lesions are to be expected in most all well-developed cases of cholera. These post mortem lesions greatly resemble the post mortem lesions found in typhoid fever of man.

DANGER OF RECURRENCE ON INFECTED PREMISES.

Authorities differ as to length of time required for cholera infection to die out on an infected premise. However, it is definitely known that the virus will remain virulent for as long as four months when exposed to drying by ordinary atmospheric conditions. It may be killed much more quickly by exposure to the direct rays of the sun. The feces of infected animals retain their virulence for sixty-five to ninety-five days. My personal experience would indicate that it is unsafe under the climatic conditions encountered here (Tennessee) to endeavor to raise unvaccinated hogs on a farm or other infected premise until after an interval of at least twelve months has elapsed from the last outbreak. Disinfection of premises as ordinarily practiced is valueless in eliminating the danger of reinfection. In fact, in my opinion, the disinfection of premises by any method or under any circumstances is of doubtful value in controlling cholera infection on a farm. It is often misleading in affording false security from the lurking danger of subsequent outbreaks.

The best advice bearing on this point I am able to give is to do one of two things: either raise "immunes," or retire from the hog-raising business for at least one year—preferably the *former*.

METHODS BY WHICH HOG CHOLERA SPREADS.

Remember that the infection must always come from the outside. The disease never arises spontaneously. The urine is much more virulent than any of the other body secretions or excretions. The feces are also heavily laden with infection. The infection enters through the digestive tract.

The infecting agent of hog cholera is just as virulent and dangerous to hogs as is the virus of smallpox to people. Various animals, such as dogs, rabbits, cats, buzzards, crows, pigeons, and other birds, may carry the germs to another herd. Often when a hog dies the owner thinks little of it and the carcass is allowed to remain in the pen to be eaten by the other hogs. Or the carcass is left in the field as a prey to other meat-eating animals. This hog may have been the first to be infected and die of hog cholera, and by this method of disposition the seed is sown for a good crop of cholera in the neighborhood. In known outbreaks carelessness in the disposition of dead carcasses may result in useless spread of the disease. The germs may be carried on the shoes or clothing of anyone handling the hogs to herds subsequently visited. Stock cars used for shipping hogs are to be considered cholera-infested unless thoroughly cleaned and disinfected.

Visiting Infected Places.—It is dangerous for the swine owner to visit infected places and return to his own herd without at first disinfecting at least his shoes.

Show Hogs.—Show hogs may bring the germs of the disease to the farm upon their return. For this reason they should be held in quarantine at least two or three weeks before being allowed to run with the other hogs.

Running Streams.—Running streams, such as rivers, creeks and branches, spread cholera by washing the infection down stream from hog cholera outbreaks above; hence it is unsafe to endeavor to raise hogs where they have access to running water.

Public Roads.—Public roads are disseminators of hog cholera. Hogs affected with cholera are liable at any time to be passing and repassing on these public highways; hence it is unsafe to allow hogs access to public roads.

Public Stock Yards.—Every public stock yard in Tennessee and every other State is permanently infected with the virus of hog cholera, hence no man should ever think of removing hogs from a public stock yard for breeding or feeding purposes. Whenever a hog goes into one of these public stock yards the only safe place for him is direct to the abattoir for immediate slaughter.

The Turkey Buzzard.—Aside from public stock yards, I consider the turkey buzzard directly responsible for most of the outbreaks of hog cholera in Tennessee. If you drag the carcass of a horse or cow or that of any other animal which has died of pneumonia, colic, or any other disease out on the farm and allow this carcass to be consumed by buzzards, the same buzzards which flock there in droves to



Fig. 5—Turkey Buzzard.

devour this carcass may have come directly from a hog cholera carcass fifty or even one hundred miles away, bringing the infection to your farm, and starting an outbreak of cholera among your own hogs. This emphasizes the importance of burning or burying all dead animals on the farm.

Many of the Southern States afford the buzzard legal protection. This accounts in part for their great numbers. At one time the buzzard was protected by law in Tennessee. At that time anyone killing a buzzard was liable to arrest and fine. Of course when the law was passed no one had any idea that the buzzard was such a spreader of disease.

Some people are under the erroneous impression that the buzzard at this time has legal protection in Tennessee. For their benefit I will say that the law protecting the buzzard was repealed in 1893. Since that date the buzzard has had no legal protection in this State. Any person can kill a buzzard without violating any State law. Since this is a fact, every good citizen should do his part toward exterminating the buzzard, as they are a menace to the live stock raising industry on account of being a spreader of not only hog cholera, but black leg, anthrax, and many other contagious and infectious diseases.

If all persons would make it a rule to bury all animals which die on their farm, then there would be no inducement offered the buzzard to visit their premises. Besides being an attraction to buzzards, the stench from foetid carcasses of large animals constitute a public nuisance in any community.

PART II.—ANTI-HOG-CHOLERA SERUM PLANT.

Excerpt from General Appropriation Bill passed by the Fifty-eighth General Assembly:

"To establish a serum plant for the purpose of manufacturing and distributing anti-hog-cholera serum to the swine owners of Tennessee at actual cost of production; said plant to be under the direct supervision of the State Veterinarian. The amount of this appropriation to be paid out of the State Treasury on vouchers approved by the Commissioner of Agriculture. \$10,000.00."

THE PLANT.

The plant is modern in all its appointments. It is fireproof, sanitary, and electric lighted. It is equipped with the most up-to-date fixtures, machinery and laboratory apparatus that money could buy, including cold storage facilities. The sewerage system is complete.

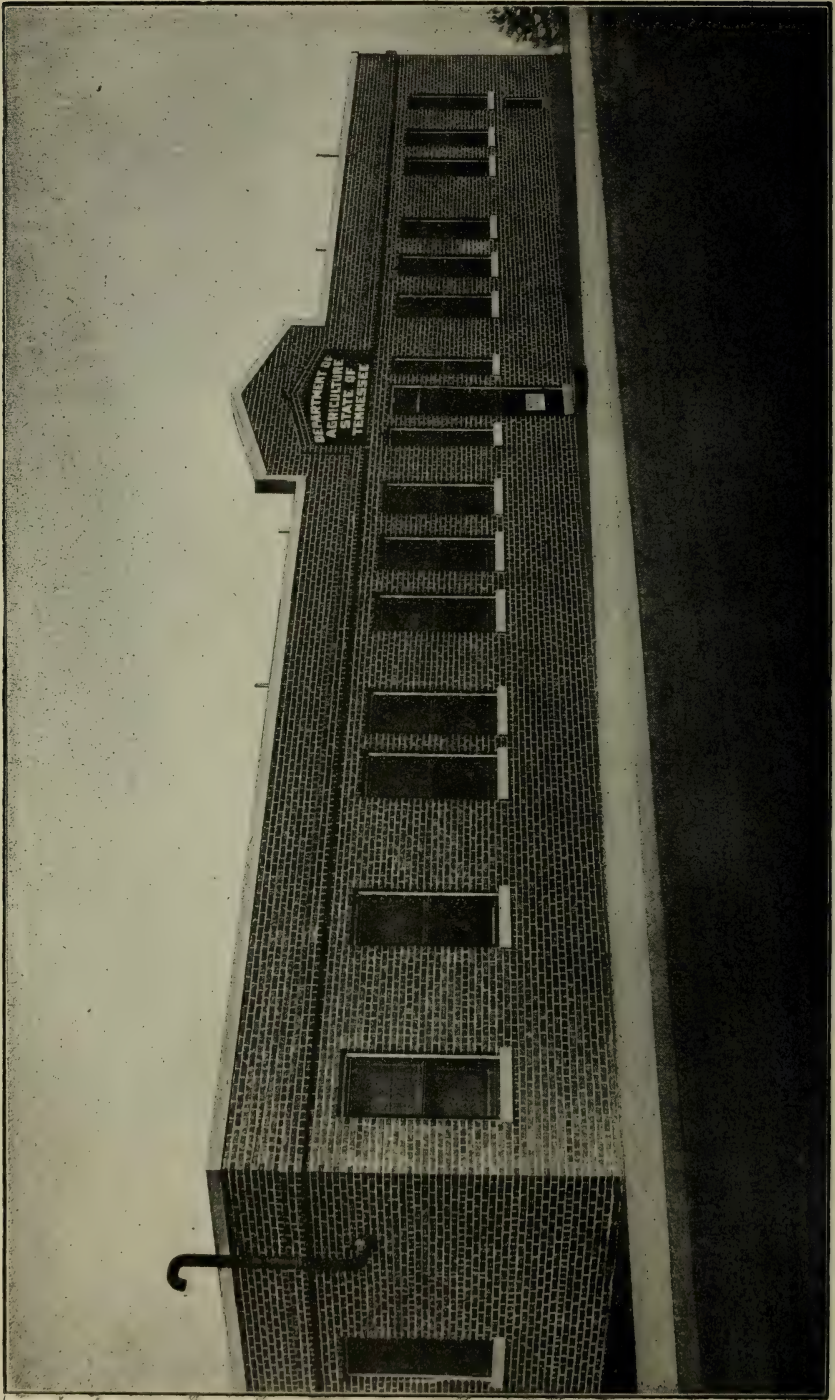


Fig. 6—State Anti-Hog-Cholera Serum Plant, Located at 1502 Clinton Street, Nashville, Tenn.

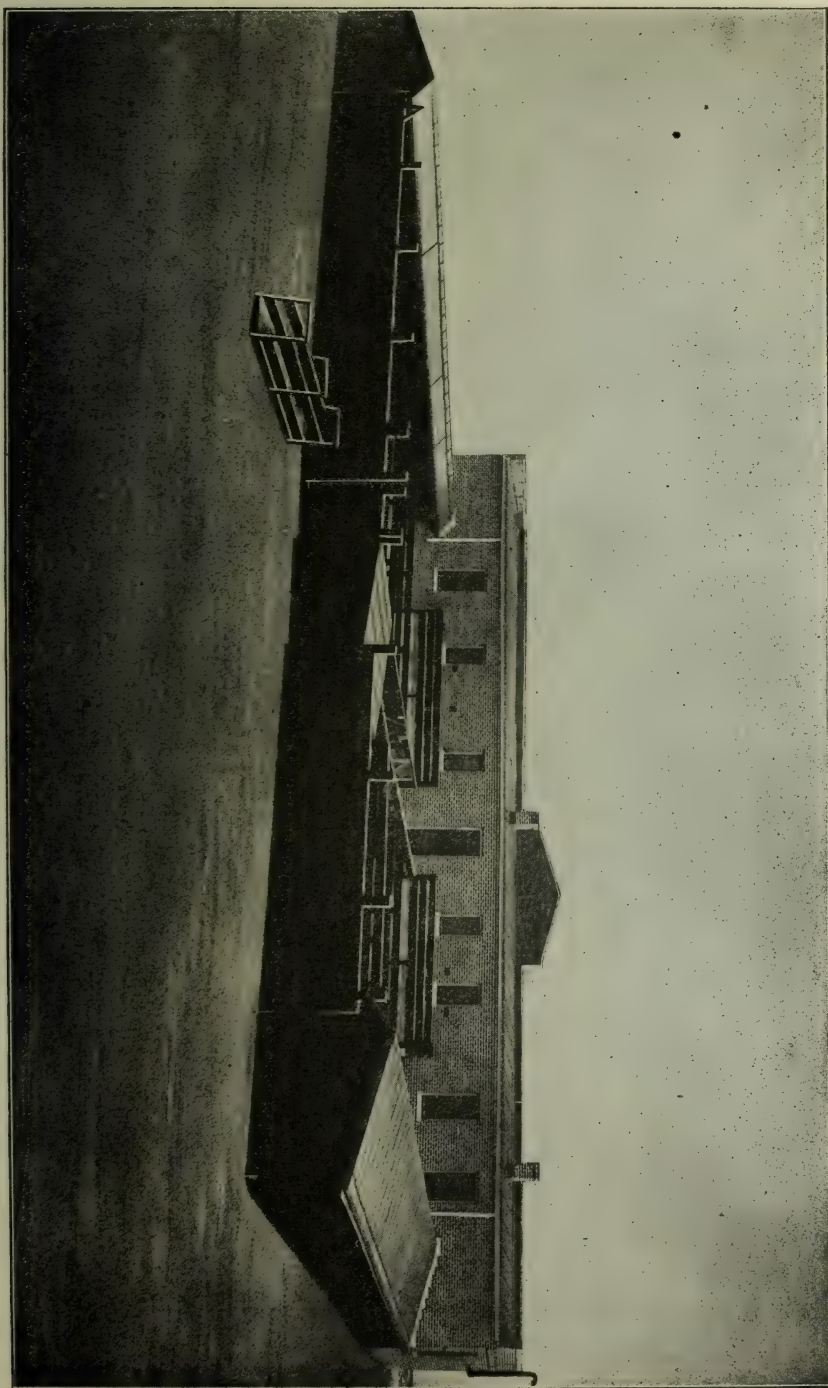


Fig. 7—Rear of Plant.

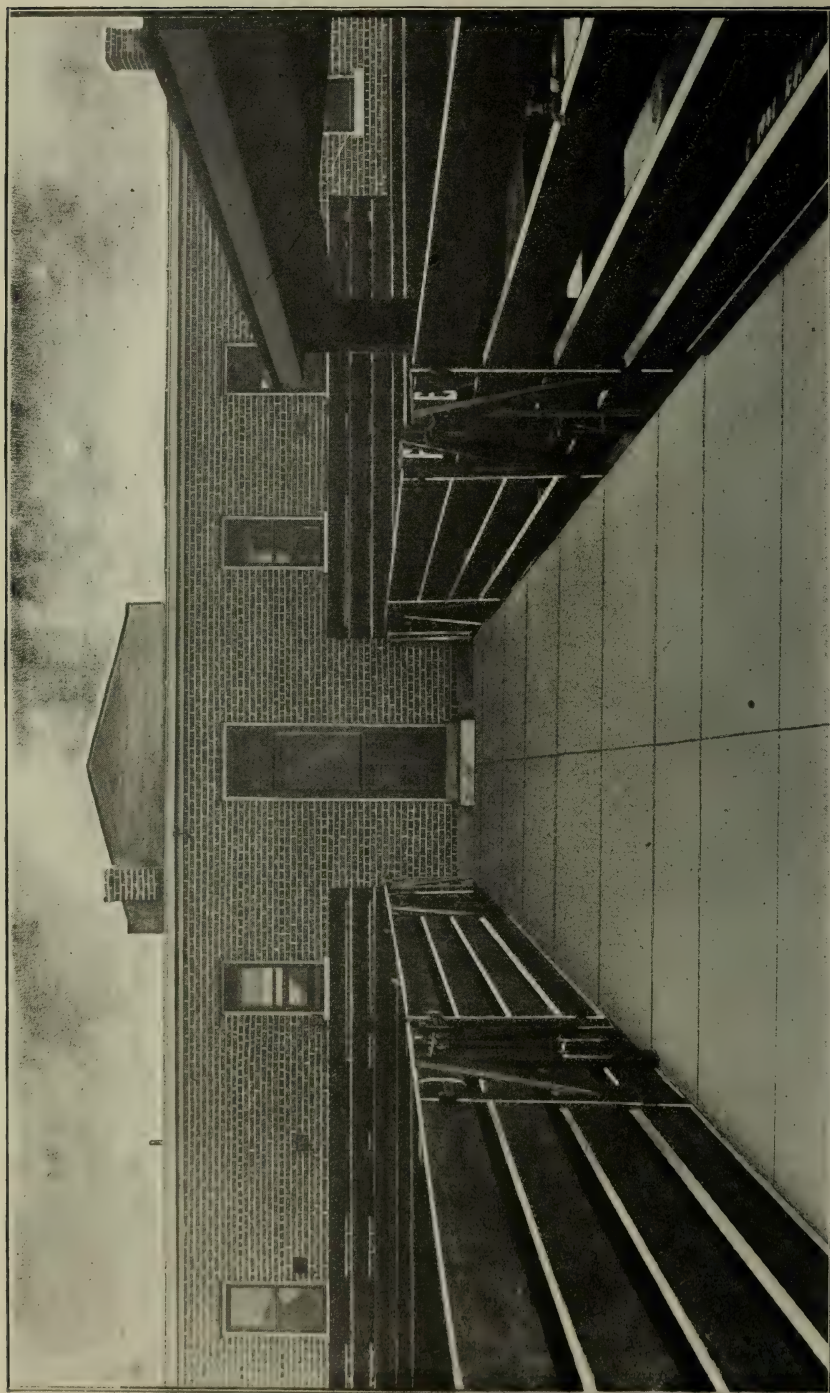


Fig. 8—Rear View, Showing Gate Entrance to Pens and Concrete Alley Way.

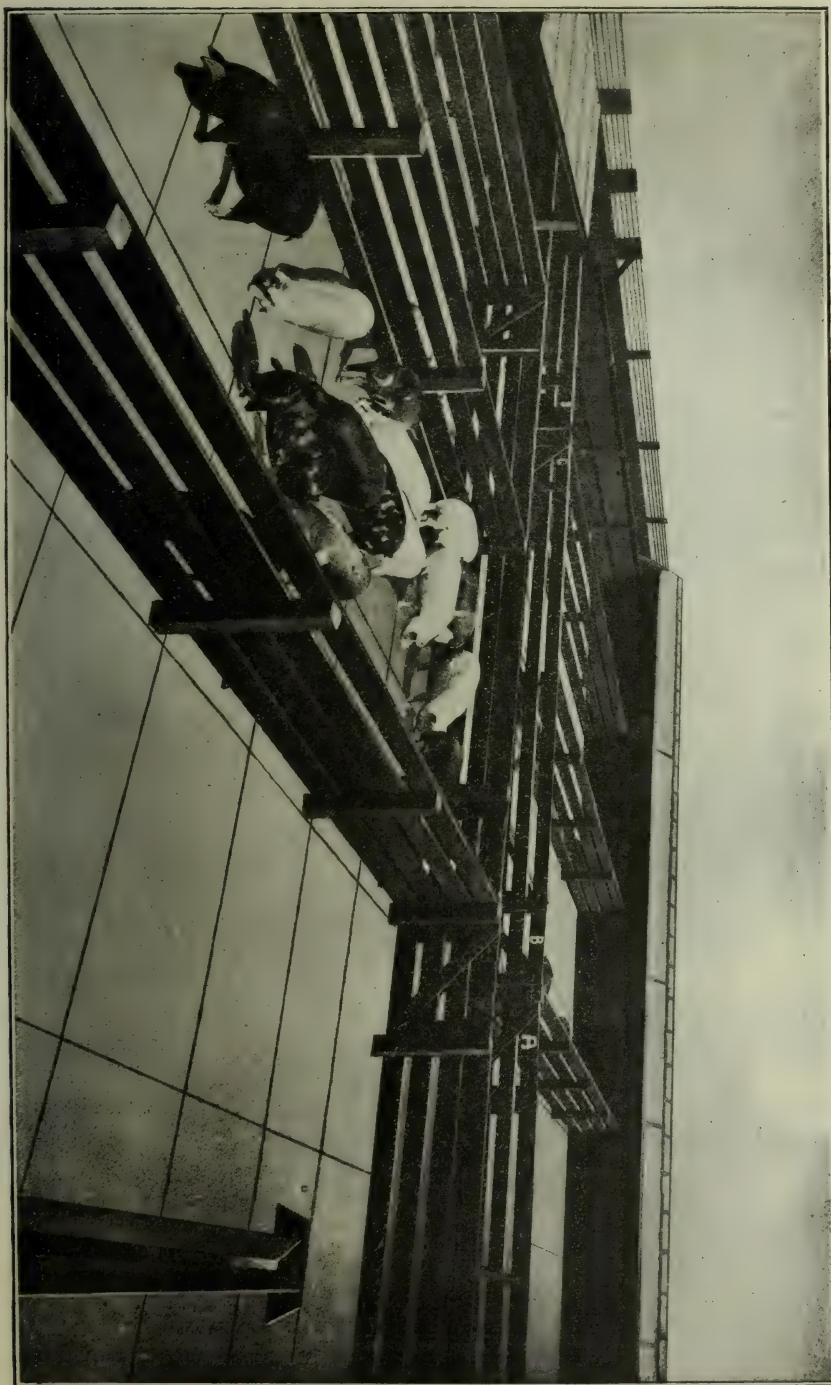


Fig. 9—View of the Pens.

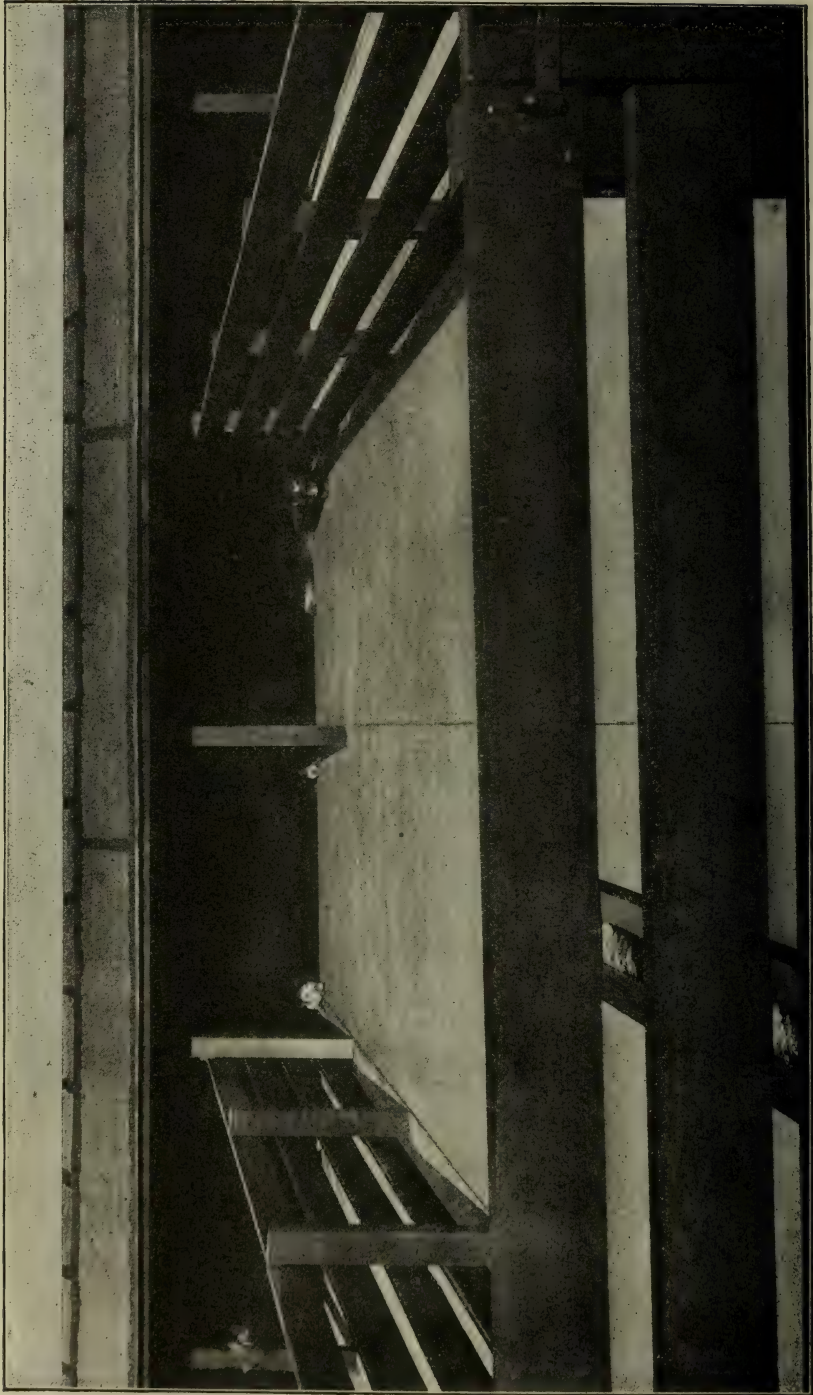


Fig. 10—One of the Pens.

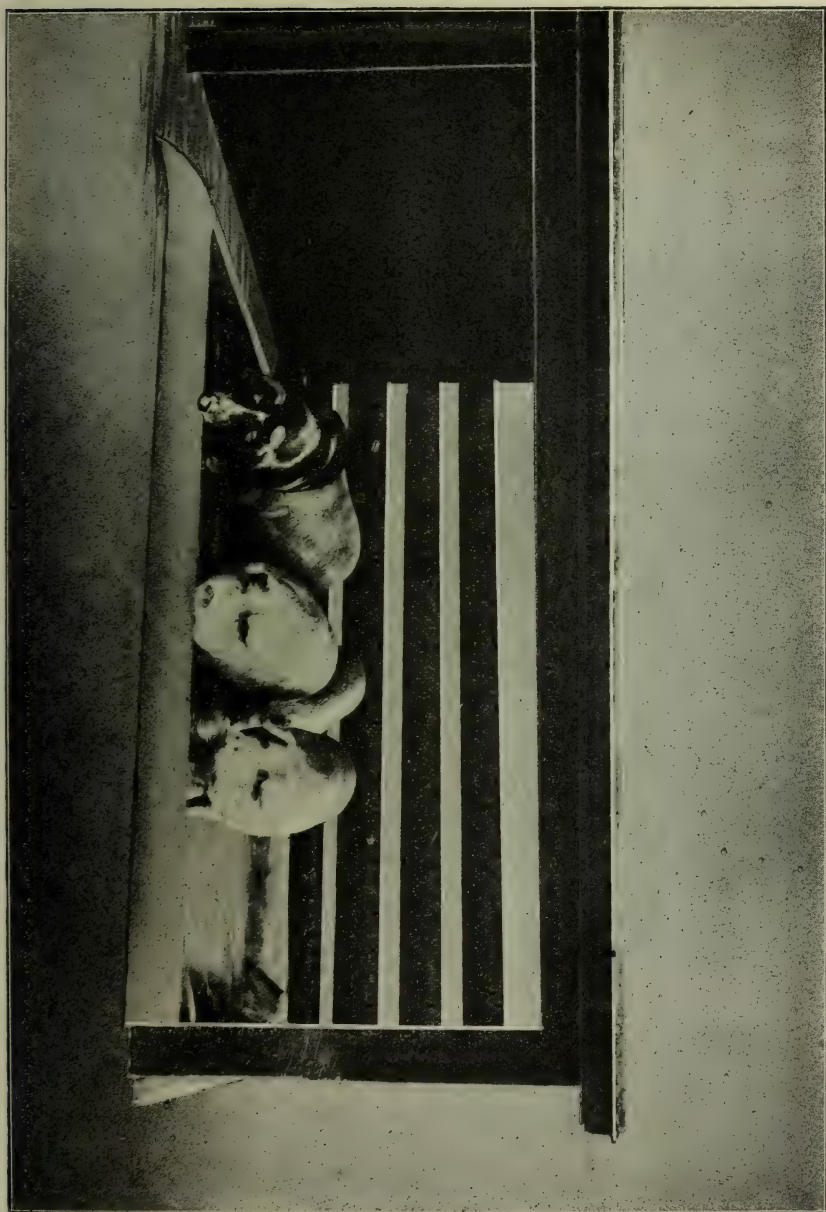


Fig. 11—Concrete Hog Wallow.

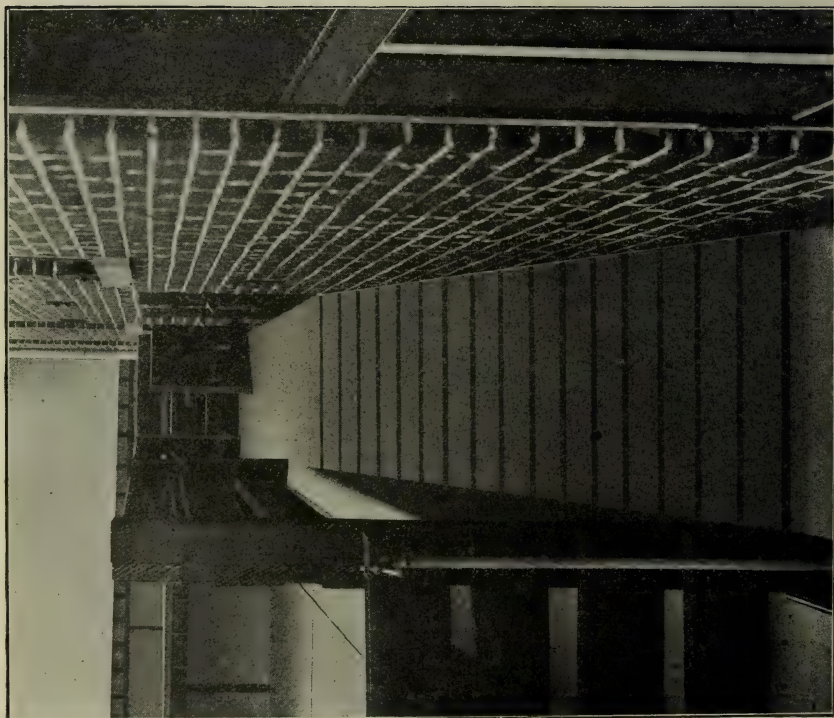
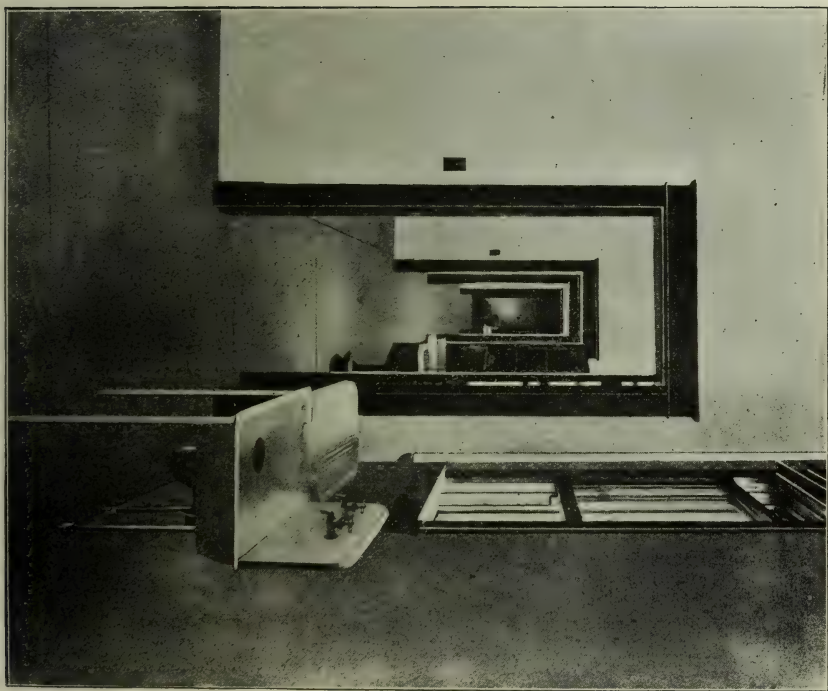


Fig. 12—Hog Entrance to Operating Rooms.

Fig 13—Interior View of Plant.



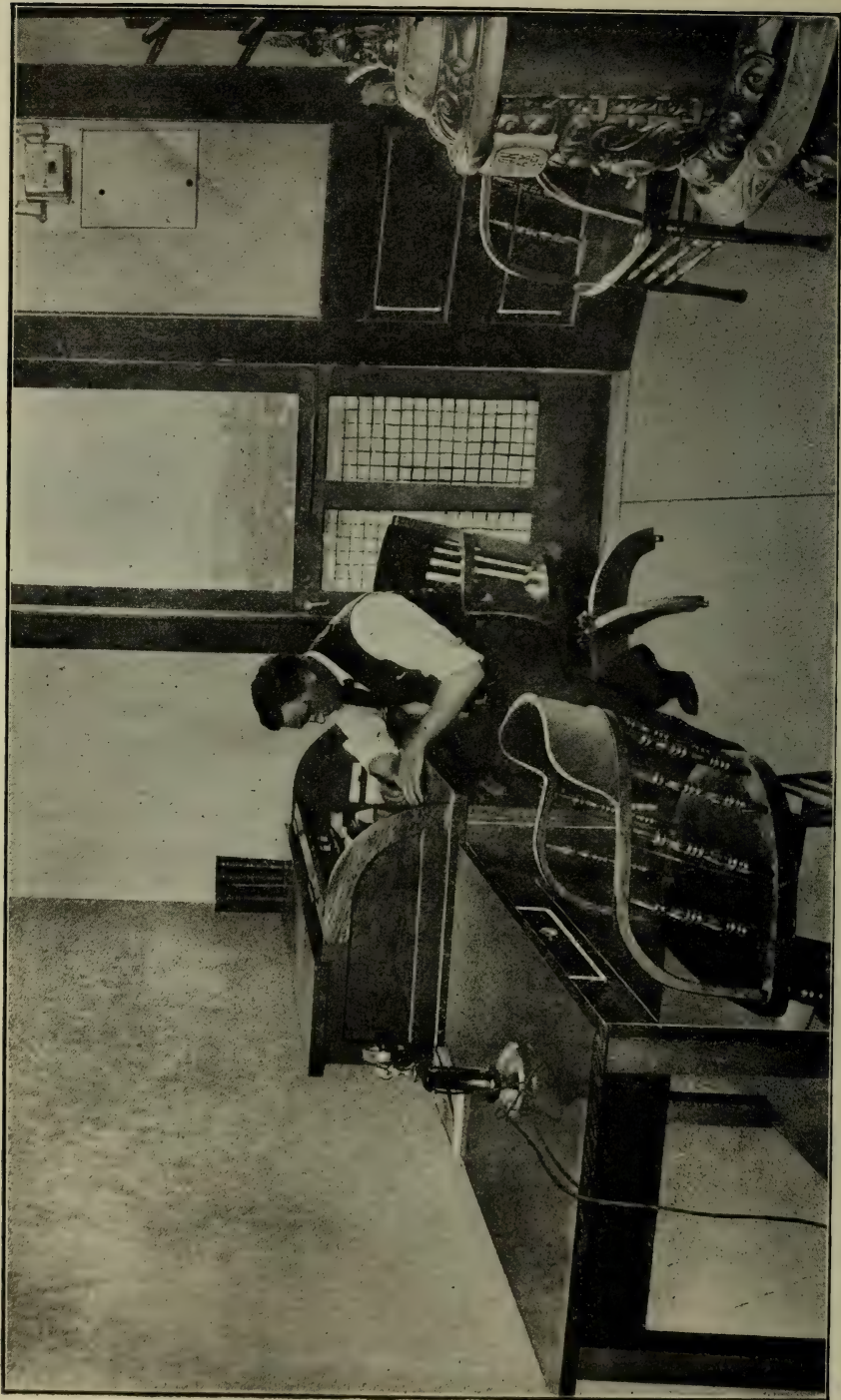


Fig. 14—Office.



Fig. 15—Bedroom.

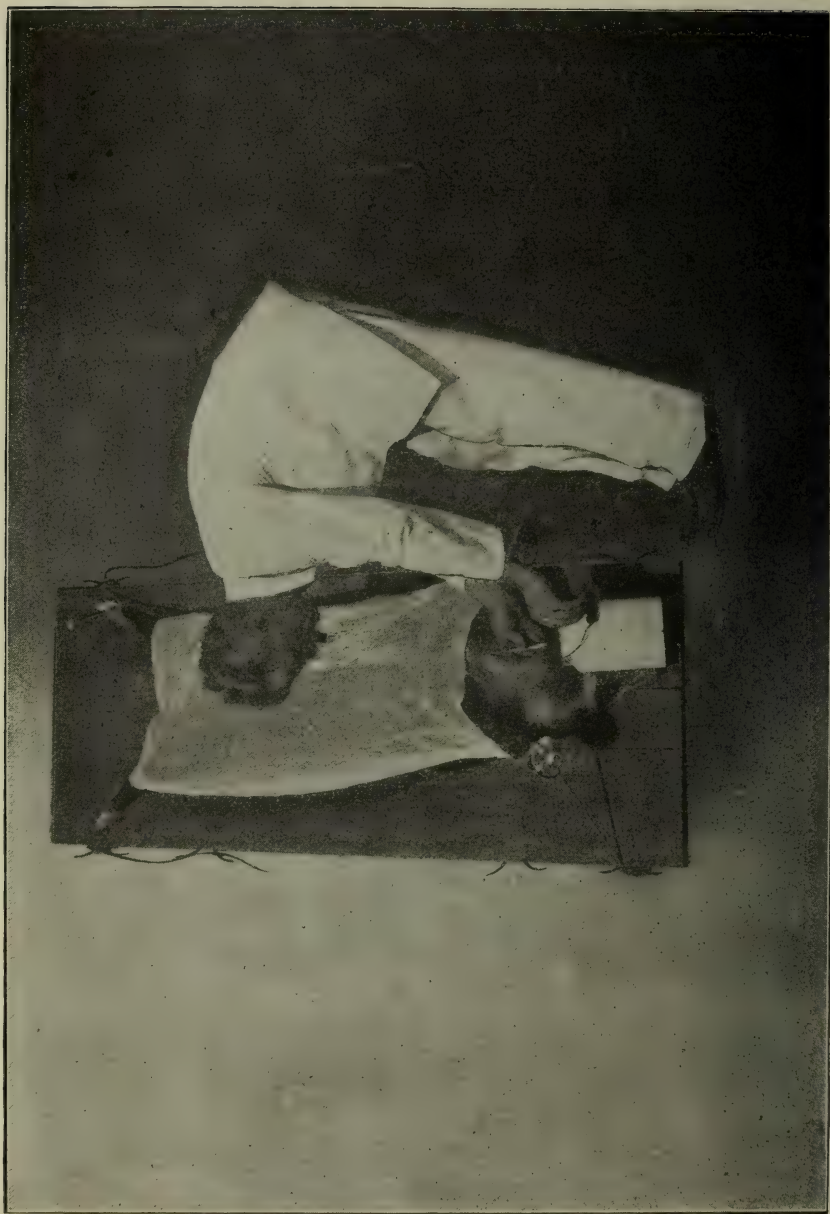


Fig. 16—Bleeding for Virus.

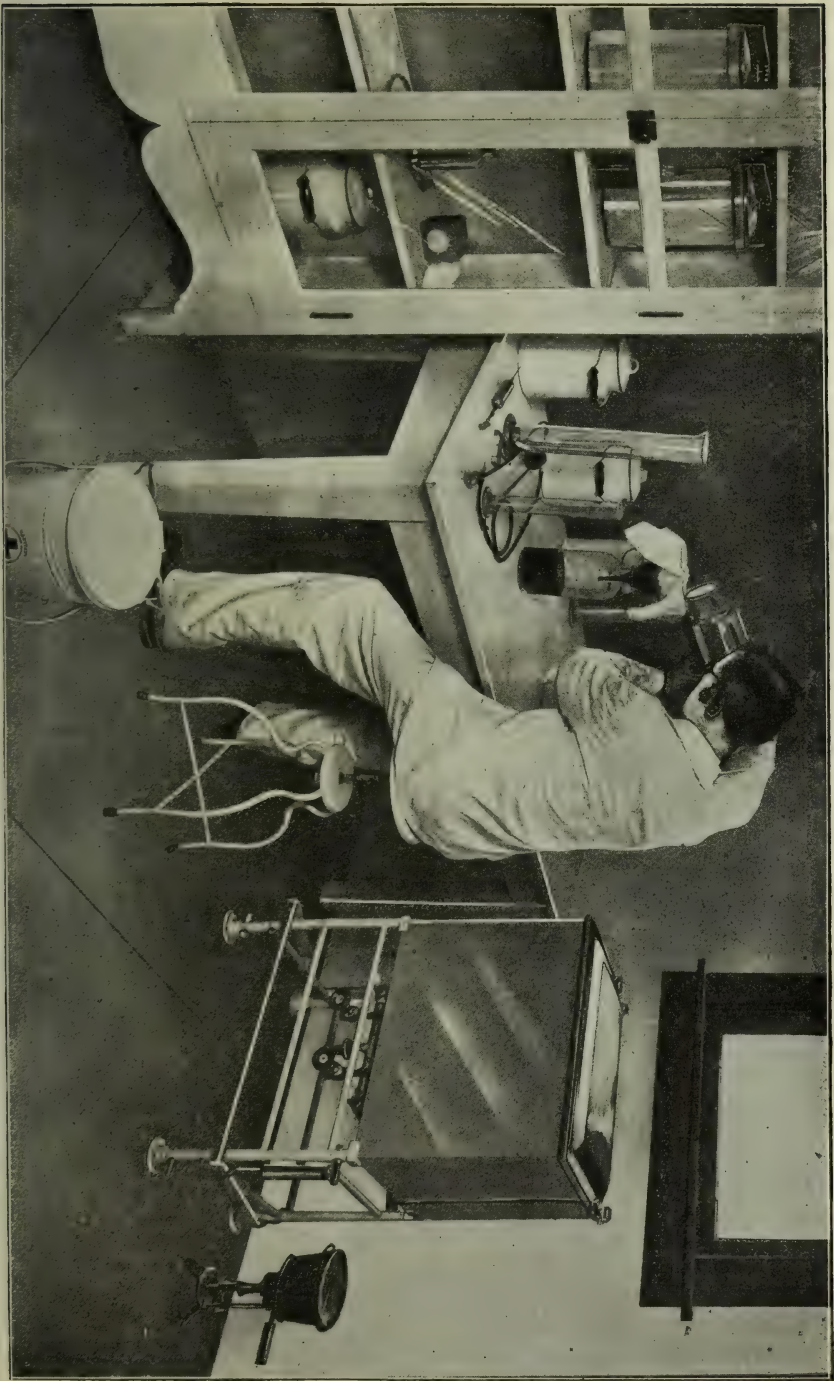


Fig 17—Virus Laboratory.

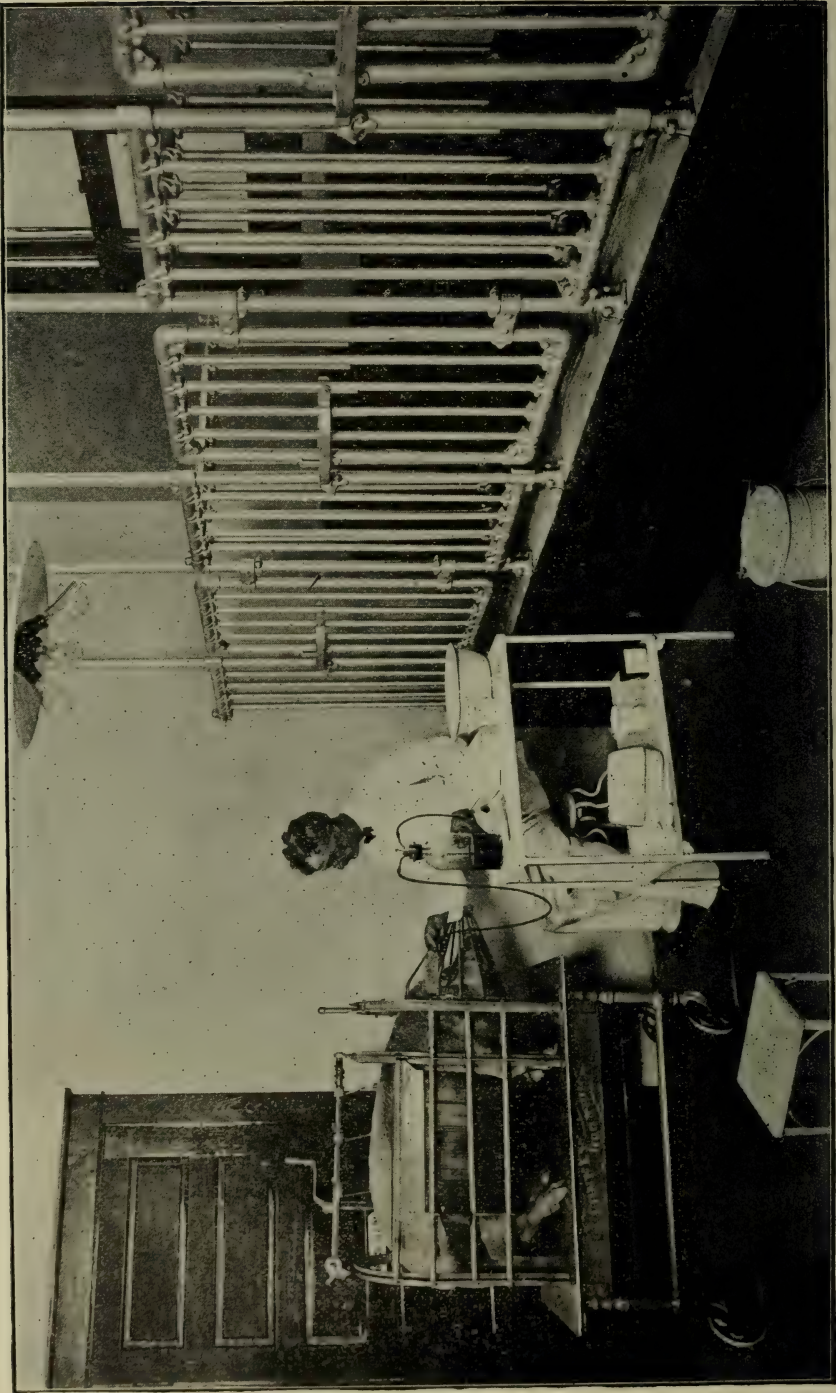


Fig. 18—Operating Room No. 1 (Hypering)

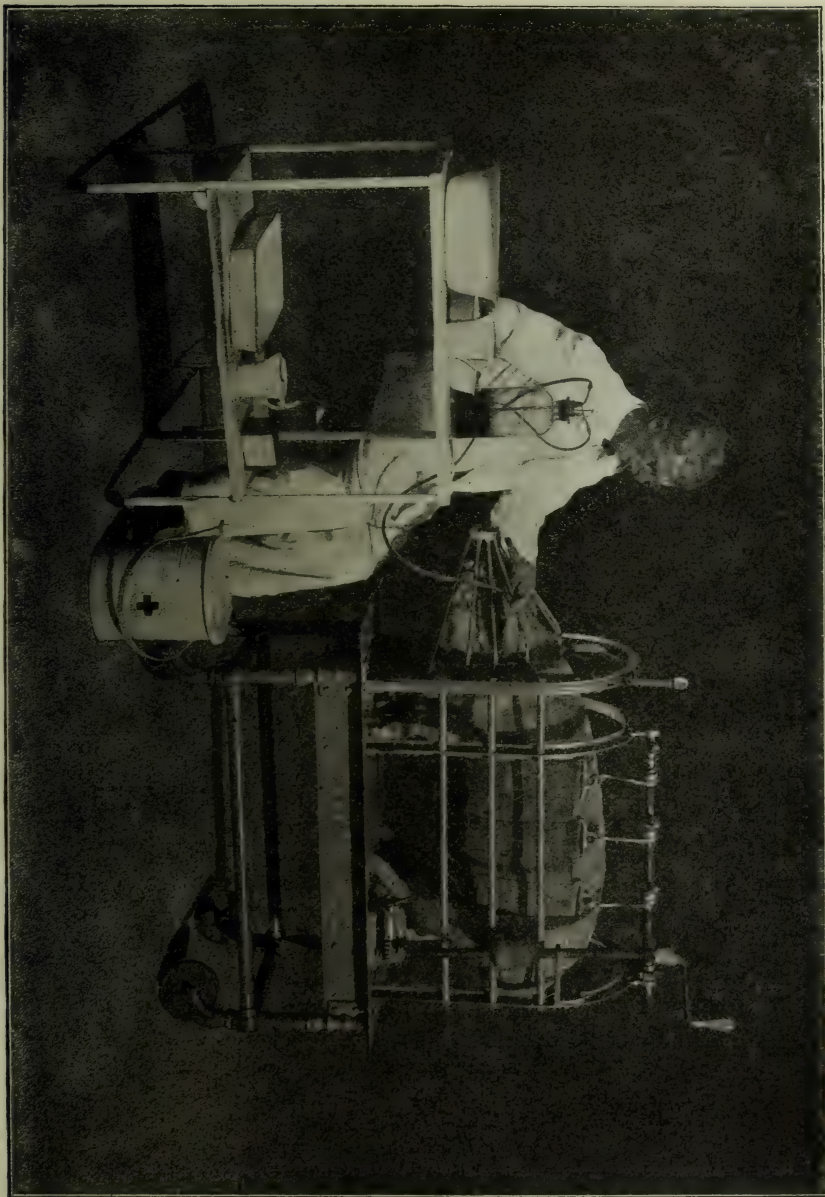


Fig. 19—Intravenous Hypering (Ear Vein)

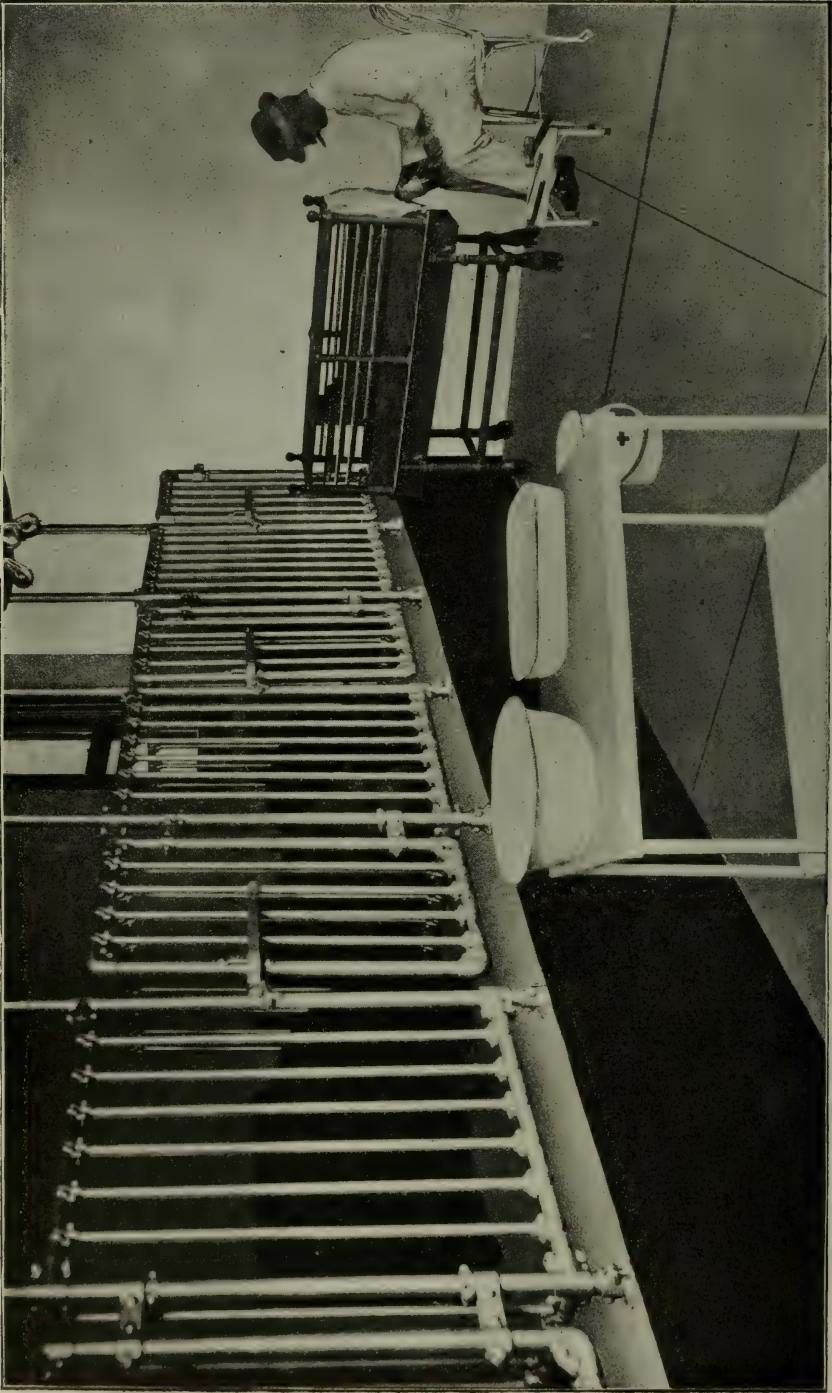


Fig. 20—Operating Room No. 2 (Tail Bleeding).

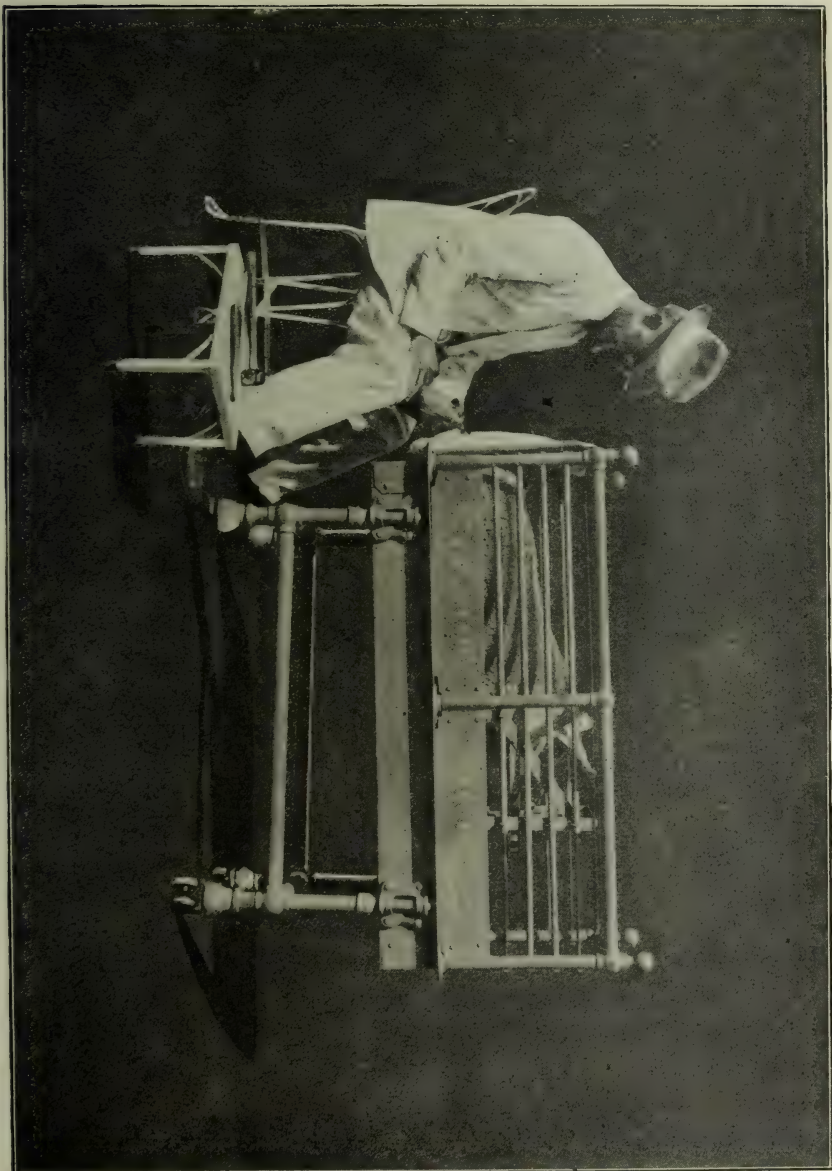


Fig. 21—Tail Bleeding.

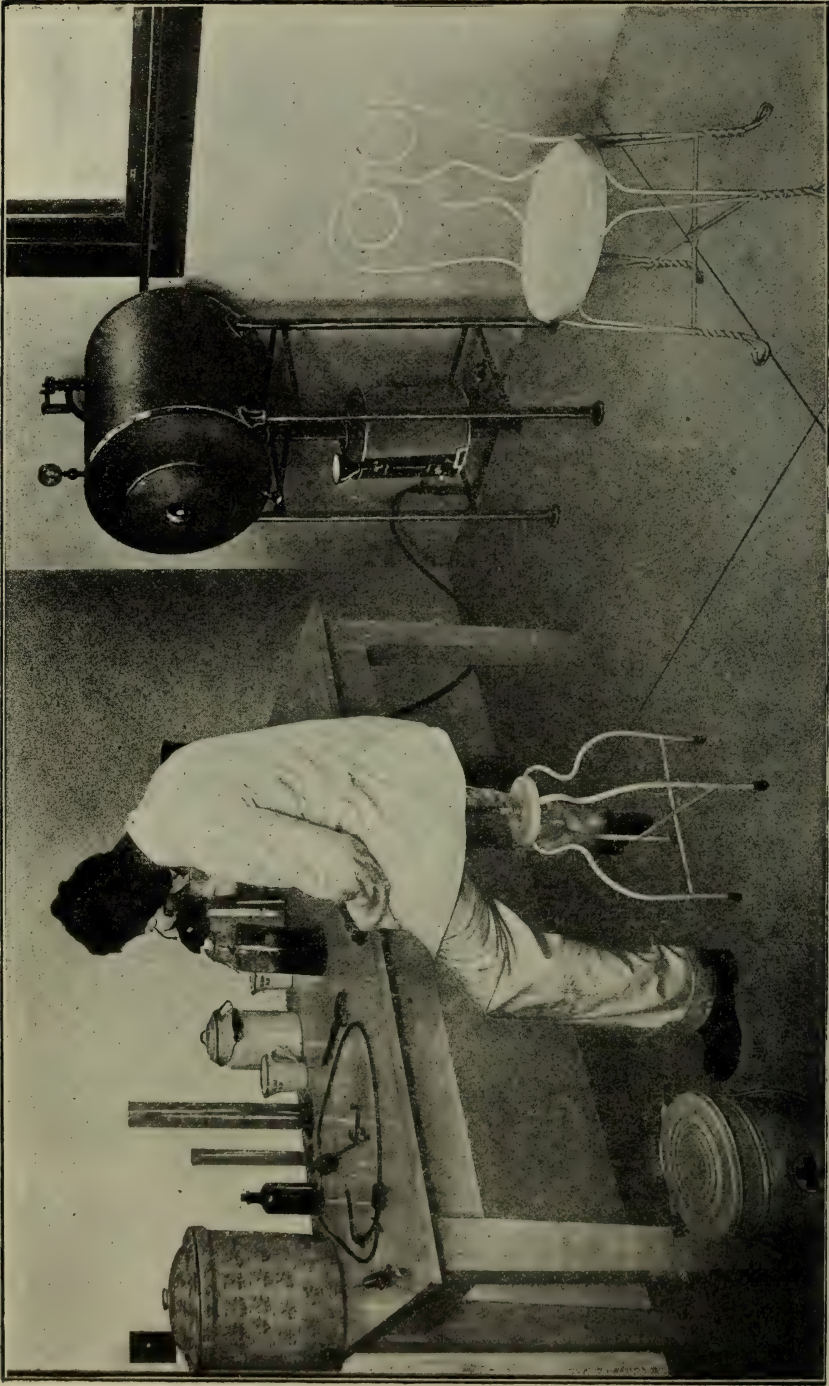


Fig. 22—Serum Laboratory.



Fig. 23—Storage and Shipping Room.

The plant fronts 100 feet on Clinton Street, and runs back 175 feet to the N., C. & St. L. Ry. It is within two squares of the Nashville Union Stock Yards, where most of the hog supply is obtained. The pens and hog sheds are substantially constructed with concrete floors throughout. The plant consists of a modern brick building 14x100 feet. This building contains bedroom for attendants, office, hypering room 14x17 feet, virus laboratory 10x14 feet, bleeding room 14x20 feet, serum laboratory 10x14 feet, and storage and shipping room 10x14 feet.

The operating rooms and laboratories have a capacity of 500 hyperimmunes; hence to treble the capacity of the plant would only entail a small expense for additional pens and sheds on the remainder of the lot, which is already State property.

PART III.—PROTECTIVE VACCINATION.

ORIGIN OF THE DORSET-NILES METHOD.

Dr. M. Dorset, together with Dr. W. B. Niles—who conducted most of the field experiments—perfected the Dorset-Niles Anti-Hog-Cholera Serum until now it is well out of the experimental stage. We have no hesitancy in assuring swine owners that this serum when properly made and intelligently administered will protect healthy hogs against cholera under all conditions and circumstances.

To Dr. Dorset, a native Tennessean, belongs the honor and credit of discovering anti-hog-cholera serum. He was born and raised near Columbia, in Maury County, and is now Chief of Bichemic Division of the U. S. Bureau of Animal Industry. Many eminent scientists claim that in the discovery of this method of combating hog cholera Drs. Dorset and Niles have given to the world the greatest discovery known to the science of veterinary medicine. We, as Tennesseans, should at this time be especially appreciative of this great achievement of Dr. Dorset, who has reflected credit and honor upon Tennessee and the nation at large.

SERUM PRODUCTION.

To produce potent anti-hog-cholera serum in accordance with the Dorset-Niles method it is necessary to start with an immune hog. To secure this "immune" it is necessary to get a hog which has been injected with serum and virus at least twenty-one days before, or select a hog which has recovered from the disease itself, as it is a well-known fact that when a hog recovers from an attack of cholera he is forever thereafter "immune."

After securing the immune it is necessary to obtain "virus" (blood from a hog on the verge of death from cholera. See Fig. 16) for injection into the ear vein of this immune. The amount of virus necessary to hyperimmune an immune weighing 300 pounds would be 1500 c.c. (approximately three pints). This virus is given intravenously, the ear vein being used. (See Figs. 18 and 19.) After an interval of fourteen days the hyperimmune is bled from the tail. (See Figs. 20 and 21.) The usual amount taken should not exceed the amount of "virus" given, which would mean 1500 c.c. from a 300-pound hog. After an interval of seven days the hyperimmune is again bled from the tail. At the end of the fourth week the hyperimmune is carried to the abattoir for slaughter and final bleeding.

After this blood from the hyperimmune is secured it is defibrinated by specially-constructed machinery in the serum laboratory of the plant. (See Fig. 22.) To this defibrinated blood one-half of one per cent carbolic acid is added, which acts as a preservative.

ANTI-HOG-CHOLERA SERUM.

Anti-hog-cholera serum is the defibrinated blood (liquid portion of the blood) of a healthy hyperimmune hog. It is impossible for this serum to cause hog cholera, because it is charged with "antibodies" which possess the property of being antagonistic to the hog cholera infection, and will protect or immunize any hog against this disease.

FAKE "SERUMS" AND "VACCINES."

With the advent of the Dorset-Niles Anti-Hog-Cholera Serum a few years ago the most deadly of all swine diseases was doomed to ultimate eradication from the American continent. It is a well-known and fully-established fact that until then the swine owners' investments in hogs was at all times jeopardized by this disastrous disease.

Long ago all well-informed individuals fully realized that every medicinal treatment for hog cholera which had ever been proposed was worse than worthless in "curing" this disease. The swine owners' pocketbooks were continually being depleted and flattened by so-called "hog cholera cures" of all kinds and descriptions which in reality were nothing more nor less than "fakes" and "frauds" compounded for the purpose of wrenching hard-earned dollars from the honest, though gullible, hog owner.

The press—agricultural press in particular—carried in each and all issues glaring advertisements of numerous so-called "cures for cholera." In spite of the large amounts of money spent for these

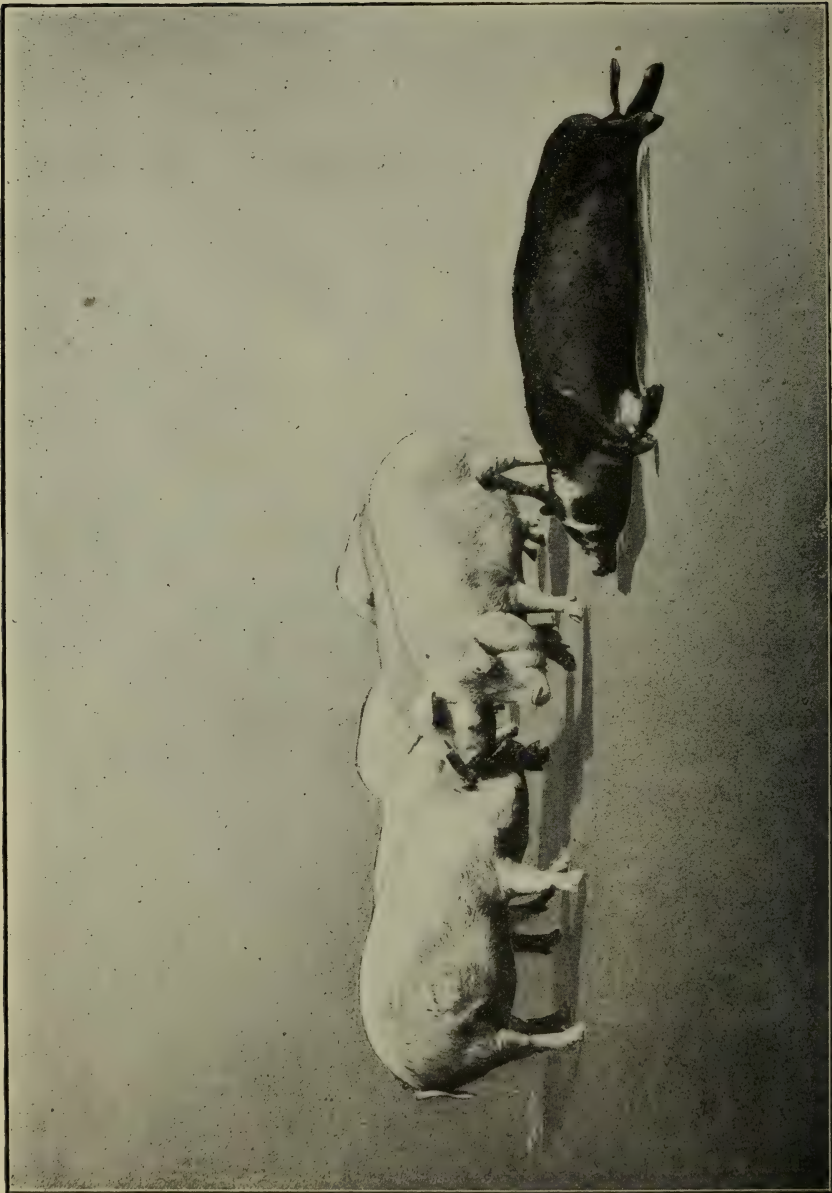


Fig. 24—The White Hogs Were Protected from Cholera by Simultaneous Method.
The Vaccinated Black Hog Died from Cholera.

"fake remedies," hog cholera continued to spread with cyclone-like rapidity. Since the discovery of the Dorset-Niles Anti-Hog-Cholera Serum and its demonstrated and undisputed efficiency the "fakers" have shifted their advertisements from "medicines" to so-called impotent fake serums and vaccines, for which it behooves the farmers of Tennessee to be on the constant lookout.

The Dorset-Niles Serum, when properly made by reliable and well-trained men according to the U. S. Government standards and by other definitely-defined technique of Drs. Dorset and Niles, when properly administered, will undoubtedly protect healthy hogs from cholera. However, the field for fraud and deception is so inviting that the unscrupulous fakers have already invaded it with their worthless "juice" in the form of "vaccine" or "serum." Look out for them, and refuse to allow them to separate you from your hard-earned dollars.

Before purchasing anti-hog-cholera serum from anyone take the precaution of determining whether or not the manufacturer is in possession of a permit from the State Agricultural Department for its sale in Tennessee. Up to November 10, 1913, only fifteen commercial firms have been granted permits to market anti-hog-cholera serum in Tennessee. The names of these firms will be furnished upon application to the State Veterinarian.

At the present time this State is being flooded with advertisements—by mail and otherwise—of at least thirty commercial firms who have something attractive—in price or otherwise—to offer the swine owners for the treatment and prevention of hog cholera. Beware of these and remember that all medicines advertised as "hog cholera cures" are worthless and that 50 per cent of the "serums" and "vaccines" are frauds and are sold and distributed in this State in open violation of law.

We are arranging for submitting all the commercial serums now offered for sale in Tennessee to rigid tests to determine their potency. As soon as these tests are completed the department will expose all "fakers" by publishing their names in Tennessee agricultural and other papers of the State.

INSTRUMENTS AND UTENSILS NECESSARY FOR VACCINATING HOGS.

(See Fig. 25.)

30 c.c serum syringe.....	\$3 50
1½ c.c. virus syringe.....	1 50
Swine thermometer	1 00
100 c.c. cylinder graduate.....	50
Total	\$6 50



Fig 25—Instruments and Utensils Used in Vaccinating Hogs.

The above are kept in stock and may be secured from the plant at prices quoted.

METHODS OF VACCINATING.

Two methods of vaccinating are in vogue, viz.: serum alone, and simultaneous method. The serum alone method means injection of serum without virus. This method only affords temporary immunity—three to six weeks. We do not advocate or even indorse this method as the immunity is too transient in comparison to the expense incurred.

The simultaneous method consists in the injection of a small amount of virus at same time serum is injected. This method affords life immunity and does not cost one cent more and does not require one minute additional time than the serum alone method. This simultaneous method has our unqualified indorsement and is the only one we advocate.

STATE LAW.

In order to protect the swine industry from the indiscriminate use of virus the following Act was passed by the Fifty-eighth General Assembly:

CHAPTER 6, ACTS 1913.

AN ACT to regulate the distribution, sale and use of virulent blood from cholera-infected hogs, or "virus," and to prescribe penalties for violation of same.

SECTION 1. *Be it enacted by the General Assembly of the State of Tennessee*, That it shall be unlawful for any person, firm or corporation to distribute, sell or use in the State of Tennessee, virulent blood from hog-cholera-infected hogs, or "virus," unless and until they have obtained written permission from the State Veterinarian for such distribution, sale or use.

SEC. 2. *Be it further enacted*, That any person, firm or corporation guilty of violating the provisions of this Act, or failing or refusing to comply with the requirements hereof, shall be fined not less than fifty nor more than one hundred dollars for each offense, and may be imprisoned, in the discretion of the court, not less than ten nor more than thirty days, and shall be liable to any person injured on account of such violation to the full amount of the damages and all costs.

SEC. 3. *Be it further enacted*, That this Act take effect from and after its passage, the public welfare requiring it.

HOW TO SECURE VIRUS PERMITS.

It will be observed by reading the above Act that all who distribute or use virus in Tennessee without first securing a permit from this

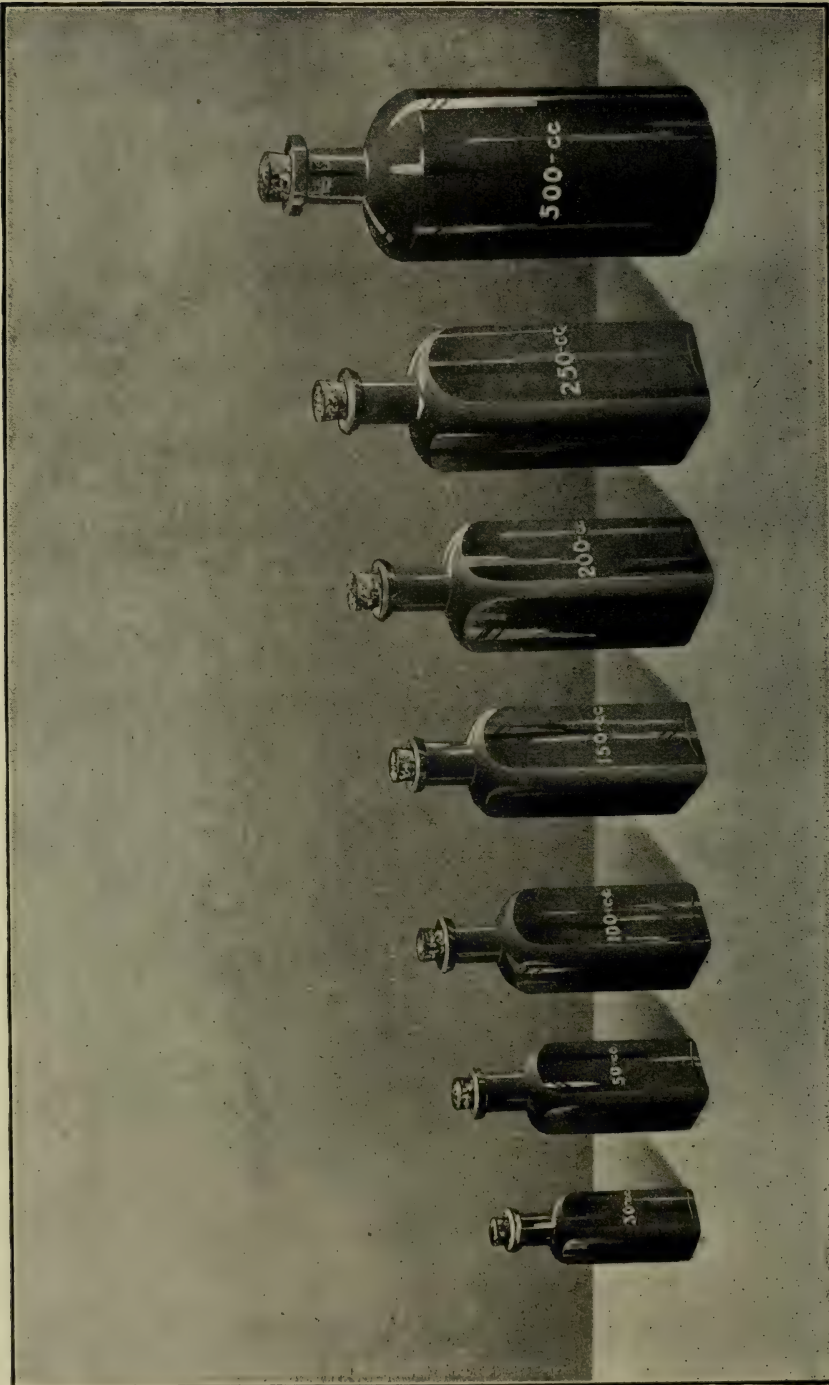


Fig. 26—Sizes of Bottles in which Serum will be Distributed.

department are violating the law. It shall be our policy to require persons to visit the plant and receive the necessary special instruction before issuing virus permit. All interested persons are cordially invited to visit this plant at any time between the hours of 9 a. m. and 4 p. m., Sunday excepted. Dr. M. W. Miller will be found ready and willing to impart the necessary information. One hour at this plant will be all the time necessary for proper instruction, and no charge for same will be made. Instruction is free to all residents of Tennessee.

DIRECTIONS FOR SECURING SERUM.

All serum will be shipped by express C. O. D. In ordering, it will be necessary to designate *express* as well as postoffice. Since virus is perishable, shipments in which virus is included will be packed in ice, and it is recommended that virus be kept on ice until used.

The present price of serum is 1½ cents per c.c., which we estimate is actual cost of production. Virus will be sent free with shipments to persons holding "virus permits" from this department. Virus will not be shipped to unauthorized persons under any conditions.

Serum will be distributed in the following size bottles: 500 c.c., 250 c.c., 200 c.c., 150 c.c., 100 c.c., 50 c.c., and 30 c.c.

Address all letters and telegrams to State of Tennessee, Cholera Serum Department, 1502 Clinton Street, Nashville, Tenn.

Serum bottles are labeled as follows:

ANTI-HOG CHOLERA SERUM

DEPARTMENT OF AGRICULTURE
STATE OF TENNESSEE

T. F. PECK, COMMISSIONER
G. R. WHITE, STATE VETERINARIAN.

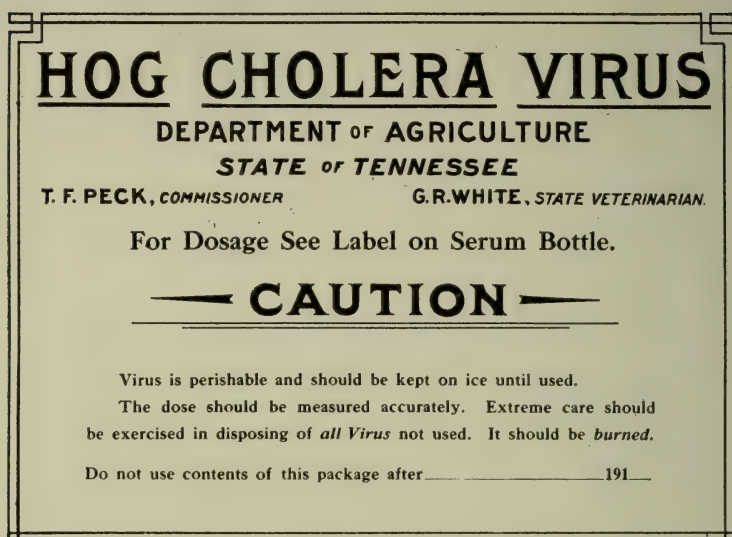
THIS BOTTLE CONTAINS _____ C.C.

DOSAGE SIMULTANEOUS METHOD

10 to 25 pound Pigs	10 cc Serum	¼ cc Virus
25 to 50 pound Shoats	15 cc Serum	¼ cc Virus
50 to 75 pound Shoats	20 cc Serum	¼ cc Virus
75 to 100 pound Shoats	25 cc Serum	¼ cc Virus
100 to 125 pound Hogs	30 cc Serum	1 cc Virus
125 to 150 pound Hogs	35 cc Serum	1 cc Virus
150 to 200 pound Hogs	40 cc Serum	1½ cc Virus
200 to 250 pound Hogs	50 cc Serum	1½ cc Virus
All Hogs over 250 pounds	60 cc Serum	1½ cc Virus

LOCATION OF PLANT, 1502 CLINTON STREET
TELEPHONE MAIN 5247
NASHVILLE, TENN.

Virus bottles will be labeled as follows:



IMPORTANT NOTICE.

1. Remember that there is a very decided and important distinction between *serum* and *virus*.

Serum is the defibrinated blood of a healthy hyperimmune hog and is incapable of producing cholera.

Virus is the defibrinated blood of a hog sick of cholera and is capable of producing the disease unless used with discretion and extreme care.

2. Virus is perishable and should be kept on ice until used. Don't order "virus" unless you are in possession of a "virus permit." Don't use virus after expiration date marked on bottle label. This date is ten days after virus is drawn from hog. Burn all virus not used. Do not handle virus on public roads, commons or ranges. Don't inject virus into a hog which is already sick. Take temperature per rectum; if the temperature is above 104 degrees it indicates that the hog is sick. Into such a hog inject a double dose of serum—no virus. Inject serum and virus into all hogs showing a temperature below 104 degrees F. The normal temperature of swine is 102 to 103 degrees.

3. Great care and cleanliness is exercised in the manufacture of anti-hog-cholera serum; hence it behooves those who are to use it to use at least ordinary caution in handling and administering it.

4. Serum is preserved with $\frac{1}{2}$ per cent carbolic acid which is, to

say the most of it, an extremely weak preservative in this strength, hence serum should be kept in a dark, cool place until used. Keep it in a refrigerator if possible. However, an ordinary cellar temperature is permissible. Never expose serum to sunlight or heat from stoves, radiators, steam pipes, etc.

5. Never open more than one bottle at a time, and never pour the contents of this one bottle into any other bottle or vessel. Always pour it from the original bottle directly into a 100 c.c. cylinder graduate in order to accurately measure the dose. From this graduate the syringe is filled by removing cap and piston and pouring directly into barrel of syringe.

6. All instruments and utensils used should be thoroughly sterilized by boiling before use and the hands of the operator cleansed by thoroughly washing.

7. Never underestimate the weight of the hog. Better overestimate the weight, as it is possible to give too little serum, but utterly impossible to give too much.

8. Tincture of iodine is universally recognized as the most efficient skin disinfectant, hence it is recommended that the site of injection be painted with tincture of iodine. Allow about one minute for drying before injection is made.

9. Carefully force all air out of the syringe before making the injection. Otherwise air bubbles are calculated to cause abscesses.

10. Serum should remain potent for at least six months if kept at cellar temperature in original sealed bottles.

11. Destroy all unused open bottles of serum.

12. The injections should be made into muscle of ham in pigs and shoats. (See Figs. 27 and 28.)

13. The injection should be made behind the ear of large hogs, especially those which are to be slaughtered within four to six weeks after vaccination. (See Fig. 29.) The site of injection is in the depression behind the jaw, and slightly below and a little behind base of ear. This location is recommended in preference to ham injection, on account of possibility of abscesses following the injection. If these abscesses should form in the ham their presence is rarely ever detected until the ham is sliced for food. A ham showing an abscess or any other form of discoloration after it is cooked and put on the table is repulsive and unappetizing to say the least of it. If an abscess forms in a pig or shoat they usually have plenty of time to recover before slaughter, hence the ham injection is permissible in these.

14. Never mix serum and virus. Always inject them separately;

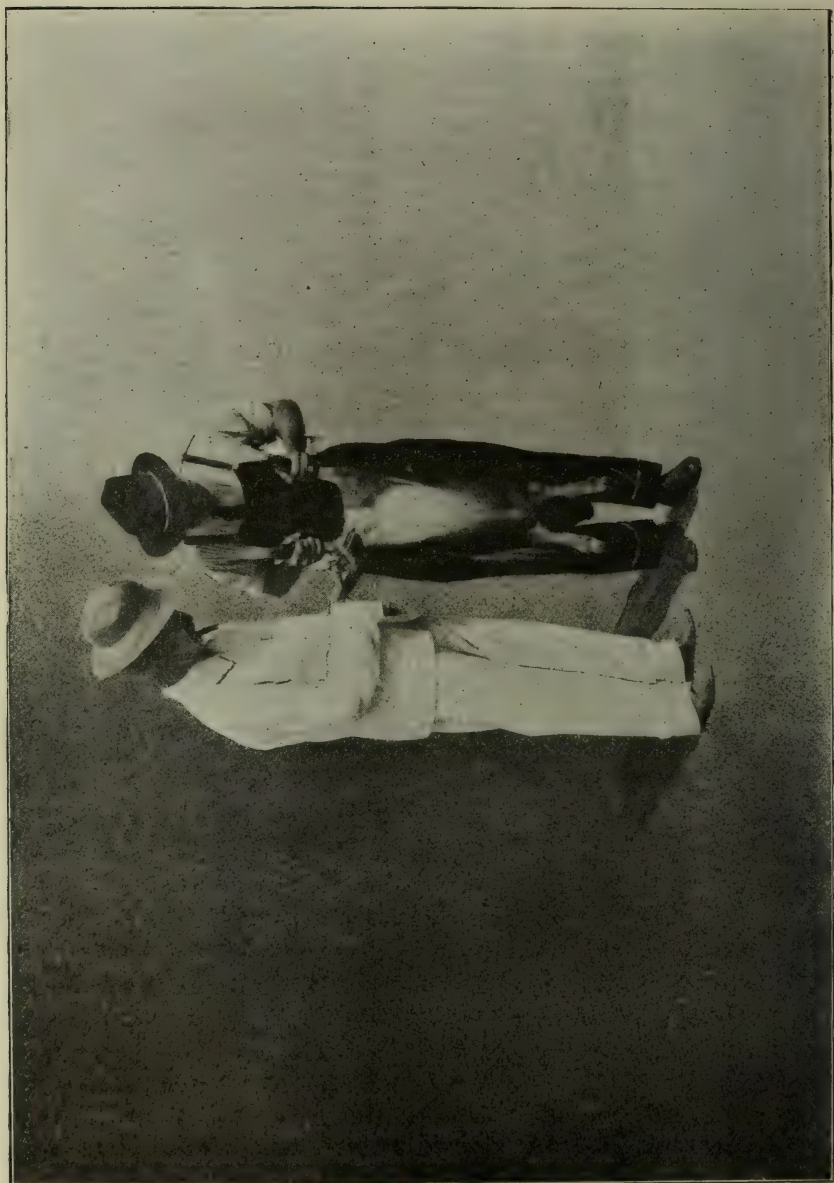


Fig. 27—Injecting Serum into Muscle of Ham (Pig).

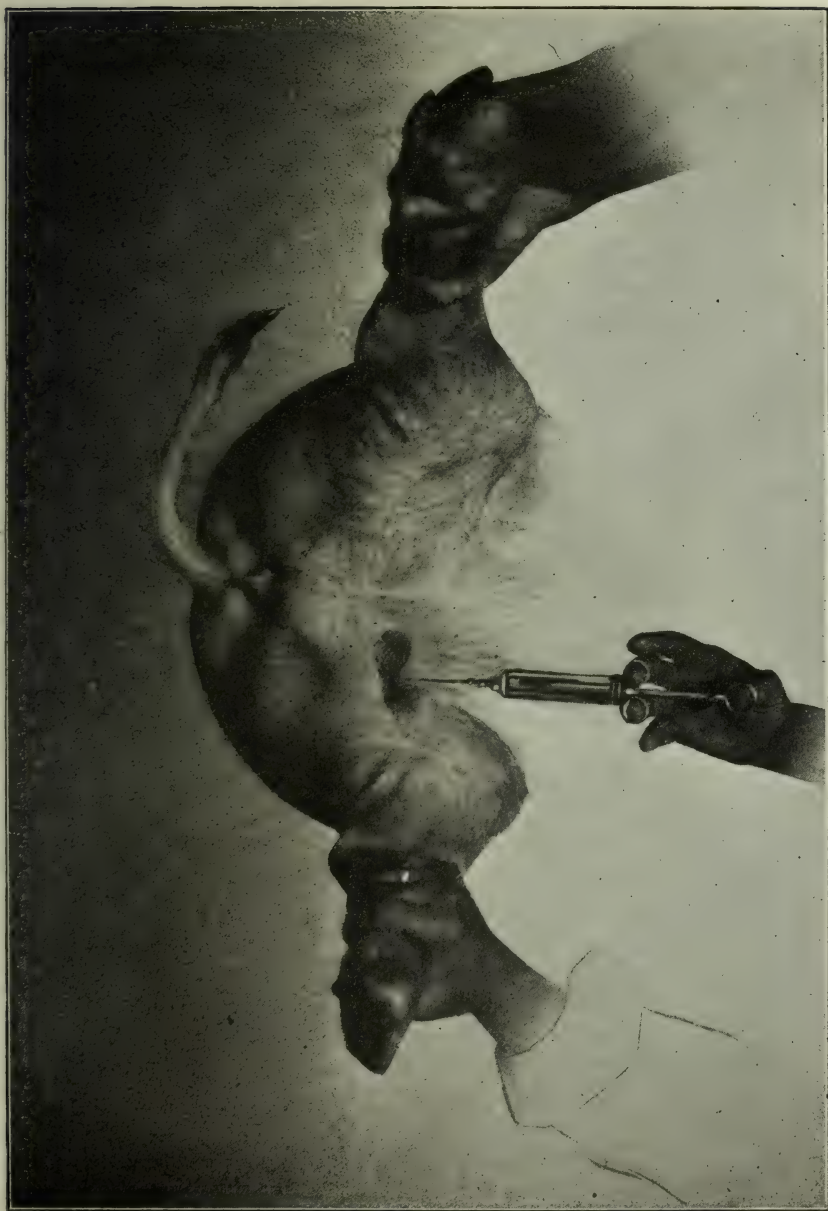


Fig. 28—Injecting Serum into Muscle of Ham (Large Hog).

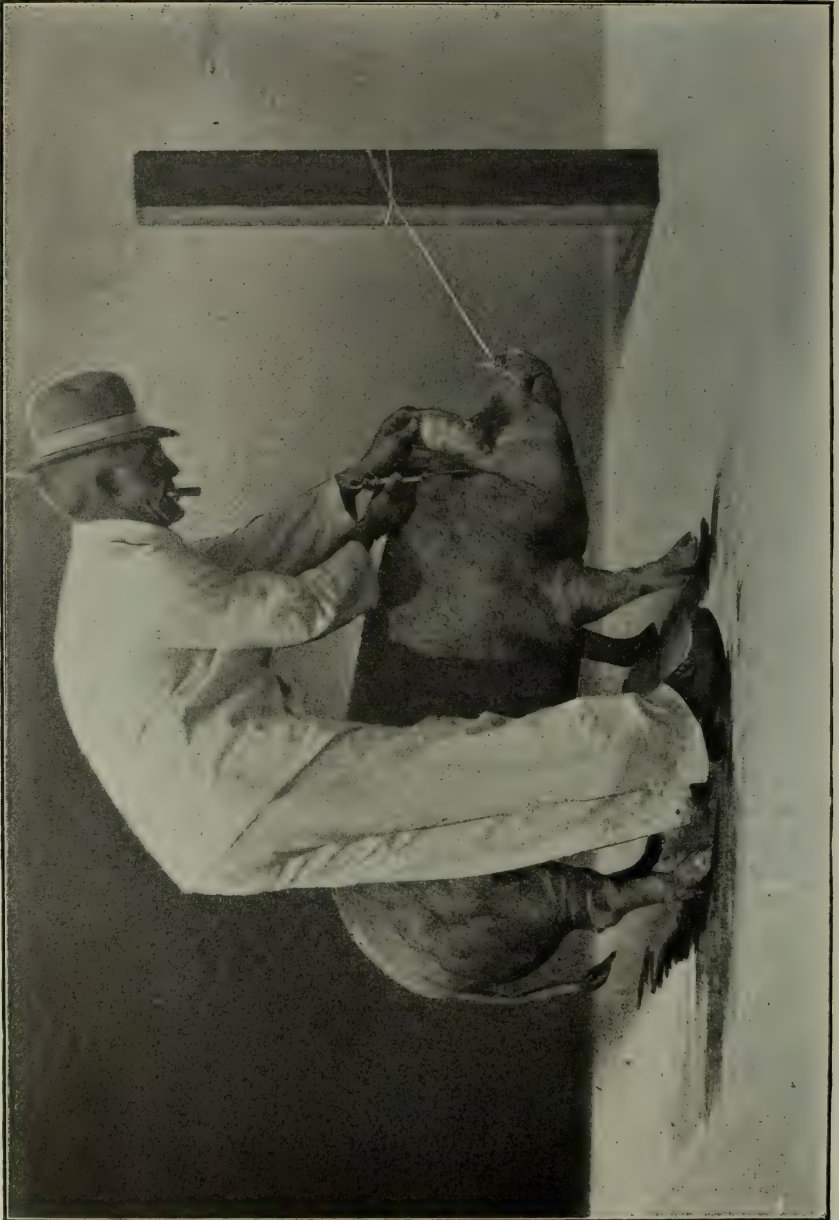


Fig. 29—Injecting Serum Behind Ear (Large Hog).

serum on one side and virus on the other. Use a special syringe for each.

15. Handle pregnant sows with care while vaccinating. The injection of serum and virus will not cause abortion, but rough and careless handling will cause it.

16. After each injection is made immerse syringe in a clean basin containing carbolic acid, one teaspoonful; warm water, one-half gallon.

17. Keep vaccinated hogs in a small lot for twenty-one days after the operation, before they are to mingle with unvaccinated hogs or run at large on public roads, commons or ranges.

18. We recommend immunizing the whole herd, then immunize each litter of pigs at or just before weaning time. This gives protection against cholera at a very reasonable cost. Make it a practice to raise only immune hogs, in which your investments in swine will be almost as safe as U. S. Government bonds.

19. Pigs from immune sows are themselves immune while they are subsisting alone on the mother's milk.

20. Do not spill any virus on the premises. That which is not put into the hog should be kept in the bottle.

21. Don't let any person who has not visited a serum plant and there received special instructions vaccinate your hogs, and don't attempt to do so yourself without receiving the necessary instructions. People are not born with knowledge of this kind. It must be acquired and the best place to acquire it is at a serum plant under direction of an expert in this line of work.

22. Serum is a protective agent against cholera. It will prevent cholera in 100 per cent of cases. We do not here lay any claim for it being a specific treatment for hogs already sick of the disease. However, we feel safe in saying that even in sick herds the losses after proper vaccination will not exceed 50 per cent. Don't wait until they are sick to vaccinate, as at this time it requires large doses of serum and is otherwise expensive. The proper time to vaccinate is before the pigs exceed twenty-five pounds in weight, as at this period they only require a small dose of serum and can be protected for life at an expense of fifteen cents per head.

23. Avoid exciting and crowding hogs before treating, as this tends to increase the temperature.

24. Wash mouth of bottles before opening.

25. Fig. 27 shows proper method of holding pigs and shoats for vaccination.

26. Fig. 29 shows proper method of restraint for large hogs.

28. Avoid the bone when inserting the needle.

29. Have helpers to catch and hold the hogs. The operator should confine himself to the actual operation.

30. Don't hurry.

31. Don't expect anti-hog-cholera serum to protect hogs against cottonseed meal poison, lye poison, pneumonia, etc., as it will not do it. It is made to protect hogs from cholera, and none other.

32. With proper assistants one man can easily vaccinate 300 to 400 hogs in ten hours.

DIRECTIONS FOR VACCINATING.

1. Sterilize instruments by boiling.
2. Wash your hands.
3. Carefully estimate weight of hog.
4. Restrain the hog by holding or otherwise. (See Figs. 27 and 29.)
5. Paint site of injection with tincture of iodine.
6. Wash mouth of serum and virus bottles.
7. Measure amount of serum with graduate and pour serum into barrel of syringe.
8. Replace syringe piston and cap.
9. Fill virus syringe with required amount of virus. See label on serum bottle.
10. Inject serum deep into muscle of ham or behind ear of one side and virus on the other side. (See Figs. 27 and 29.)

DOSE TABLE.

10 to 25-pound pigs—	10 c.c. serum, $\frac{1}{4}$ c.c. virus.
25 to 50-pound shoats—	15 c.c. serum, $\frac{1}{2}$ c.c. virus.
50 to 75-pound shoats—	20 c.c. serum, $\frac{3}{4}$ c.c. virus.
75 to 100-pound shoats—	25 c.c. serum, $\frac{3}{4}$ c.c. virus.
100 to 125-pound hogs—	30 c.c. serum, 1 c.c. virus.
125 to 150-pound hogs—	35 c.c. serum, 1 c.c. virus.
150 to 200-pound hogs—	40 c.c. serum, $1\frac{1}{4}$ c.c. virus.
200 to 250-pound hogs—	50 c.c. serum, $1\frac{1}{2}$ c.c. virus.
All hogs over 250 pounds—	60 c.c. serum $1\frac{1}{2}$ c.c. virus.

CONCLUSION.

In this great fight of science against hog cholera science will prevail and hog cholera will be as surely conquered by anti-hog-cholera serum and modern sanitation as night follows the day. The slogan should be, "All pull together for the eradication of hog cholera." When science and effort have caused hog cholera to vanish from the confines of the Volunteer State, then we will be a happier, better fed, more prosperous and better contented people.

CROP REPORT FOR OCTOBER.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., November 1, 1913.**

Crop reports from eighty-one of the ninety-six counties of the State were received under date of October 20, and indicate that the year nearing a close has been a hard one on the farmers of Tennessee.

As forecasted in former reports, the corn crop of the State will be about 60 per cent of a normal crop, the average, as figured out from the reports, being 59 per cent.

Up to date on which reports were made to the Department, wheat sowing had progressed nicely, there having been some good weather during October, which was taken advantage of for this purpose. Indications are also for a good acreage in winter oats and rye.

The Department reports show that the yield of cotton will hardly equal that of 1912, and that there will be a decrease in the yield of tobacco, sweet potatoes and Irish potatoes.

Young clover and the grasses, according to reports, show a deterioration in condition from last year. The condition in general of live stock is affected by the prevalence of hog cholera in the State. Up to the 20th of October about 57 per cent of the hog crop had been marketed.

Following is the summary, for comparison, of the crop conditions for October, for the years 1912 and 1913:

	Per cent. 1912	Per cent. 1913
Wheat, acreage sown	77	71
Winter oats, acreage sown	76	77
Rye, acreage sown	78	77
Corn, yield	79	59
Cotton, yield	71	65
Millet, seed threshed	72	56
Stock peas, seed threshed	68	57
Sweet potatoes, yield	77	67
Late Irish potatoes, yield	75	52
Tobacco, yield	83	74
Sorghum, yield	82	72
Broom corn, yield	80	66
Peanuts, yield	75	69
Young clover, condition	84	64
Grasses, condition	85	69
Alfalfa, condition	82	81
Pea Hay, saved	87	72
Apples, yield	75	43
Live stock, condition	91	86
Hogs, marketed .....	..	57

OCTOBER CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Wheat—acreage sown.	Winter Oats—acre-age sown.	Rye—acreage sown.	Corn—yield.	Cotton—yield.	Millet Seed—threshed.	Stock Peas—seed threshed.	Sweet Potatoes—yield.	Late Irish Potatoes—yield.	Tobacco—yield.	Sorghum—yield.	Broom Corn—yield.	Peanuts—yield.	Young Clover—condition.	Grasses—condition.	Alfalfa—condition.	Pea Hay—saved.	Apples—yield.	Live Stock—condition.	Hogs Marketed.
A Alluvial Plain of the Mississippi River and Plateau Slope of West Tennessee.	Lake	.....	.....	.....	75	55	.....	.....	.....	70	70	95	70	90	100	70	85	80	85	90	.....
	Obion	.....	65	95	70	.....	.....	90	95	60	.....	90	100	90	100	40	50	50	40	90	80
	Dyer	.....	100	100	70	70	.....	100	100	60	.....	80	100	.....	75	75	.....	50	50	40	80
	Lauderdale	.....	100	.....	75	65	.....	100	80	.....	.....	80	.....	.....	75	75	.....	50	50	80	.....
	Tipton	.....	100	.....	55	85	.....	40	80	90	.....	75	.....	.....	85	100	.....	90	40	100	.....
B Brown Loam Tablelands, Middle Counties of West Tennessee.	Shelby	.....	85	90	85	80	.....	90	90	.....	.....	100	.....	.....	85	100	.....	90	40	90	.....
	Weakley	.....	95	100	65	70	.....	85	75	35	85	65	50	.....	50	90	.....	100	50	90	50
	Gibson	.....	.....	.....	75	75	.....	100	75	.....	.....	90	.....	.....	100	100	.....	60	50	90	100
	Crockett	.....	75	60	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	80	.....	.....	50	30	75	60
	Madison	.....	.....	.....	70	60	.....	.....	60	90	.....	100	.....	.....	75	75	80	50	30	75	55
C Summit Region of Watershed, West Tennessee.	Haywood	.....	65	80	65	65	.....	75	53	80	.....	80	.....	.....	75	75	.....	50	30	35	50
	Hardeman	.....	.....	.....	40	95	.....	.....	90	80	.....	100	60	.....	.....	.....	.....	75	75	70	90
	Fayette	.....	100	.....	.....	85	.....	.....	.....	.....	.....	.....	.....	.....	75	75	.....	95	75	85	85
	Henry	.....	95	85	90	75	.....	85	85	70	70	75	.....	.....	75	75	.....	100	40	90	.....
	Carroll	.....	100	100	65	60	.....	50	50	.....	.....	.....	70	.....	45	.....	.....	100	40	85	.....
D Valley of Tennessee River, West and Middle Tennessee.	Henderson	.....	65	80	100	30	.....	25	100	60	75	50	.....	.....	100	100	.....	100	60	100	20
	Chester	.....	.....	50	75	60	.....	50	60	60	.....	.....	.....	.....	100	80	.....	90	.....	80	.....
	McNairy	.....	.....	90	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Stewart	.....	50	.....	50	.....	.....	.....	75	.....	90	75	.....	.....	75	90	.....	.....	.....	95	.....
	Benton	.....	50	100	100	70	.....	80	85	45	.....	90	100	60	75	80	.....	100	15	95	40
	Houston	.....	85	75	95	45	.....	50	70	50	.....	55	.....	.....	65	75	85	100	75	85	100
	Humphreys	.....	80	90	100	60	.....	65	45	40	50	75	100	75	85	95	.....	100	30	90	60
	Decatur	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Perry	.....	65	75	100	65	.....	20	60	.....	.....	85	.....	80	35	45	.....	80	10	90	.....
	Hardin	.....	50	100	100	60	.....	75	.....	.....	.....	50	.....	.....	50	75	.....	75	.....	100	25

E Highland Rim of Middle Tennessee, Western Subdivision.	Montgomery	60	90	85	50	.....	40	30	35	40	70	.....	.....	45	35	30	50	70	.....
	Robertson	100	90	85	65	.....	.....	.....	60	55	65	.....	.....	60	.....	40	50	80	40
	Cheatham	20	30	.....	50	.....	50	50	60	55	50	.....	.....	20	.....	10	50	80	10
	Dickson	90	80	100	40	.....	80	75	60	100	80	.....	.....	100	.....	50	50	90	90
	Hickman	100	.....	.....	40	10	.....	.....	15	.....	75	50	.....	75	.....	10	.....	13	.....
	Lewis	.....	90	100	50	.....	.....	30	75	85	70	40	.....	70	.....	85	.....	90	.....
	Wayne	.....	100	.....	.....	.....	.....	.....	.....	.....	75	.....	.....	.....	.....	75	50	85	75
	Lawrence	100	75	80	50	50	80	20	.....	.....	75	25	10	20	.....	75	50	85	75
	Macon	60	30	20	50	.....	30	30	20	50	20	30	30	30	.....	20	20	80	70
	Clay	20	85	90	50	.....	40	95	60	.....	90	.....	.....	20	50	15	20	95	.....
F Highland Rim of Middle Tennessee, Eastern Subdivision.	Pickett	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Overton	90	100	90	60	.....	50	75	75	80	90	.....	.....	50	50	90	10	75	60
	Jackson	30	.....	70	50	.....	40	50	.....	45	45	.....	.....	35	55	55	40	85	65
	Putnam	40	50	60	65	.....	40	50	.....	.....	50	.....	.....	75	45	50	10	75	50
	DeKalb	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	White	75	95	90	60	65	65	65	50	85	80	85	75	80	85	100	25	95	50
	Warren	60	70	.....	95	.....	50	.....	70	90	70	85	85	80	90	85	80	70	.....
	Coffee	25	50	50	75	80	.....	65	.....	.....	60	.....	.....	80	90	100	10	95	50
	Franklin	70	80	100	75	.....	.....	.....	.....	.....	.....	.....	.....	80	80	90	45	90	45
	Sumner	85	80	95	60	.....	85	99	70	80	75	.....	80	75	80	90	75	85	60
G Central Basin.	Trousdale	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Smith	95	.....	95	50	.....	65	.....	.....	50	65	30	.....	55	.....	50	95	100	.....
	Davidson	90	80	60	40	.....	60	25	25	70	.....	70	.....	20	50	40	60	40	75
	Wilson	75	30	50	60	.....	50	25	.....	40	65	50	80	50	50	75	50	80	90
	Williamson	40	.....	.....	55	.....	40	70	.....	40	65	15	60	75	.....	65	30	85	.....
	Rutherford	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Cannon	85	25	50	50	65	80	45	.....	.....	50	.....	.....	.....	.....	40	.....	.....	.....
	Maury	75	25	100	30	.....	30	30	25	75	75	.....	.....	85	.....	100	50	80	75
	Marshall	70	100	100	35	50	.....	80	25	60	50	75	10	70	.....	90	50	85	75
	Bedford	40	.....	20	30	.....	40	.....	.....	20	20	.....	10	60	.....	20	25	65	75
H Cumberland Table- land.	Giles	100	80	100	65	50	40	49	75	100	100	90	100	100	90	70	50	100	90
	Lincoln	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Moore	30	20	60	40	.....	.....	25	.....	.....	20	.....	.....	30	50	.....	10	90	90
	Scott	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Fentress	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
	Morgan	40	.....	50	20	.....	40	90	55	.....	80	.....	.....	90	85	90	20	90	.....
	Cumberland	80	80	95	85	.....	80	80	40	.....	90	80	.....	90	80	80	95	40	85
	Van Buren	50	50	25	75	.....	25	75	50	.....	50	.....	.....	65	50	70	25	100	100
	Grundy	90	90	90	70	.....	100	70	30	.....	70	.....	.....	50	80	70	15	90	40

DISTRICT	COUNTY.	Hogs Marketed.																			
		Wheat—acreage sown.	Winter Oats—acre-sown.	Rye—acreage sown.	Corn—yield.	Cotton—yield.	Millet Seed—threshed.	Stock Peas—seed threshed.	Sweet Potatoes—yield.	Late Irish Potatoes—yield.	Tobacco—yield.	Sorghum—yield.	Broom Corn—yield.	Peanuts—yield.	Young Clover—condition.	Grasses—condition.	Alfalfa—condition.	Pea Hay—saved.	Apples—yield.	Live Stock—condition.	
J Cumberland Table-land and Valley of East Tennessee.	Claiborne	50	40	55	65	...	20	60	50	...	70	75	80	65	30	40	...	40	50	60	
	Campbell	50	80	55	60	...	20	70	60	...	75	80	75	70	70	...	...	100	60	85	
	Anderson	75	90	60	60	...	40	55	50	80	75	75	65	65	75	75	...	60	75	90	
	Rhea	60	50	50	50	...	...	60	60	60	60	60	60	80	80	80	100	80	90	95	
	Bledsoe	60	100	...	...	...	20	90	70	60	70	70	70	60	60	60	100	90	30	50	
	Sequatchie	100	100	100	75	...	40	90	...	...	85	85	...	75	50	90	90	25	100	100	
	Marion	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hamilton	...	50	25	50	...	...	50	10	...	...	60	...	...	50	50	...	75	...	75	
	Sullivan	100	100	...	50	...	...	...	...	...	...	...	...	...	...	85	85	...	75	85	40
	Hawkins	100	100	10	25	...	40	75	25	...	...	75	...	...	...	25	25	...	100	50	50
K East Tennessee Valley.	Hancock	100	75	55	55	...	100	85	50	100	100	100	100	100	100	100	...	100	50	100	50
	Washington	90	90	100	95	...	100	100	90	100	100	100	60	100	85	85	95	53	30	90	60
	Hamblen	95	60	95	65	...	65	75	65	...	80	50	50	100	85	85	90	53	40	90	55
	Grainger	90	90	...	60	...	50	40	55	40	75	75	50	...	85	90	40	40	20	90	25
	Union	80	75	50	30	...	20	25	50	25	...	40	100	100	60	60	40	20	90	25	25
	Jefferson	100	100	90	35	...	35	20	85	...	100	100	100	100	85	60	95	25	95	60	25
	Knox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Roane	40	65	80	70	...	...	...	50	50	...	65	...	...	40	80	...	90	40	95	20
	Loudon	50	60	...	60	...	50	40	60	40	...	...	...	...	40	60	...	60	35	75	...
	McMinn	85	90	...	50	...	60	25	40	15	...	60	50	...	60	10	...	75	40	95	30
L Valley of East Tennessee and Unaka Region.	Meigs	95	95	100	65	...	75	40	60	45	...	80	...	...	30	45	...	55	40	95	25
	Bradley	50	50	40	50	60	80	40	50	40	30	40	40	40	50	...	80	50	90	40	...
	James	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Johnson	100	90	75	70	...	...	100	75	100	100	75	...	...	100	95	50	100	100	100	...
	Carters	95	100	...	65	...	40	30	95	80	...	90	85	...	90	90	80	100	50	90	...
	Unicoi	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Greene	95	100	...	65	...	...	95	95	10	90	90	...	...	75	75	...	85	...	85	50
	Cooke	60	85	95	45	...	...	50	75	60	...	...	...	...	75	85	90	95	25	95	50
	Sevier	20	100	50	80	80	75	80	70	75	95	90	85	80	90	90	90	95	95	95	85
	Blount
Aver. for State.		71	77	77	59	65	56	57	67	52	74	72	66	69	64	60	81	72	43	86	57

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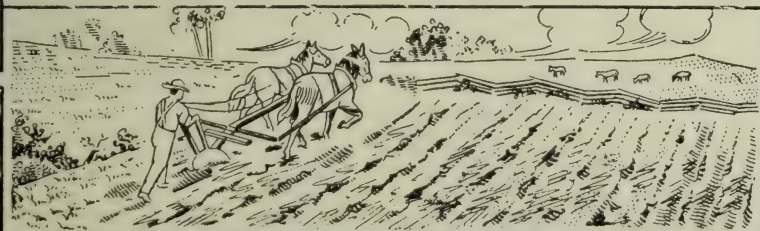
PROCEEDINGS

—OF—

Middle Tennessee Farmers' Institute
and Home-Makers Association

Nashville, Tenn.

October 21-23, 1913



TENNESSEE AGRICULTURE

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Agricultural Interests of Tennessee

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THOMAS F. PECK, Commissioner

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DECEMBER 1, 1913.

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**MIDDLE TENNESSEE FARMERS' INSTITUTE,
Nashville, Tennessee.**

TWELFTH ANNUAL SESSION.

FIRST DAY—TUESDAY, OCTOBER 21, 1913.

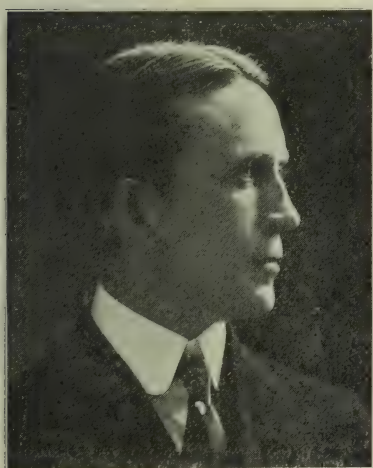
MORNING SESSION.

The Middle Tennessee Farmers' Institute met in the Agricultural Building at the State Fair grounds, Nashville, at 9:30 o'clock Tuesday morning, October 21, 1913, in its twelfth annual convention, with about 800 delegates present at the opening session.

The convention was called to order by President Robert Gallagher. The invocation was offered by Dr. R. Lin Cave, of the Woodland Street Christian Church.

The address of welcome was delivered by Gov. B. W. Hooper. His address follows:

WELCOME ADDRESS OF GOV. B. W. HOOPER.



LADIES AND GENTLEMEN: I suppose that speeches might be graded in something the same way that I heard a lady say once visits were graded. She said if anybody comes and stays with you a month it is a visitation; if they stay just a little while, for a decent length of time, it is a visit; and if they just "bob" right in and out it's a viz. Speeches, I say, might be graded that way, on down from orations to speeches and small talks, and it is only a small talk I am here to deliver to you this morning. Men as busy as I am have no time to deliver speeches. I have delivered but few since I have been Governor.

Some of you farmers think that no officeholder knows what real, hard, genuine work is, but I want to say to you that when you go out on your farm to get your hay in before a thunderstorm, I want you to remember then that the Governor of Tennessee works just that hard eighteen hours a day almost all the time.

It is a pleasure to me to talk to "hill billies," as Josh Billings said,

"one of whom I am which." I have been accused of trying to stir up prejudice between the farmers and the city people. There is no reason why there should be any prejudice between the people in the country and in the cities of Tennessee. There is every reason why there should be none. My observation of mankind has been that folks are just folks, wherever you find them. I have known country people all my life, and I have known city folks for three years, and I find that they are just folks wherever you see them. Their environment may be different, but, after all, they are just men and women, human beings, with the same thoughts, the same loves and the same hatreds.

There was a time, I presume, when there were no people in the world but "hill billies;" there was a time when there were no great centers of population, but that was a time back beyond recorded history, either sacred or profane. As far back as history goes men had begun to get together and build towns and cities, and of course, it was the country people who began to build the towns. The people in the beginning were scattered sparsely over the earth. The country people are still building the cities. You can go out here in the city of Nashville and you will find that a great percentage of the best business men are men who came to Nashville from the country districts when they were boys or young men, and they have assisted greatly in the progress of this city, and the same is true of every city in the country. When the country fellow comes to town and gets broke to town ways, he knows how to take care of himself as well as the man who has been there a long time.

I remember a little thing that occurred down in Atlanta, Ga. You may know that Atlanta contains a large number of people from Tennessee, and especially from East Tennessee. They went in there immediately after the war, when things were stirred up in Tennessee. They took hold of things as they found them, and they helped to build the city of Atlanta. I once heard it said that a fellow was walking along the streets of Atlanta one day. He saw a sign hanging across the street, and that sign read, "Einstein & Jenkins." The fellow was struck with the lack of harmony in the names on the sign. He went up to a boy who was sweeping the sidewalk and said to the boy, "That's a funny sign; I take it that Einstein is a Jew; what about Jenkins?" The boy said, "Jenkins is a hill billy from Tennessee." The fellow walked off and said, "God help the Jew." He seemed to have perfect confidence that Jenkins would take care of himself, even associated with Einstein, a Jew.

Now, instead of stirring up prejudice between the city and country people of this State, it has been my purpose to make them feel that they were one and the same people, and that there ought not to be one set of laws governing the country people that were not applicable to the people in the cities as well. Instead of trying to draw distinctions between the country and the city people, I have tried to impress upon the people that there is no distinction—that they are all citizens alike of this great State. That has been my aim and purpose. I am glad to say today that we seem lately to be making some progress in that direction.

Away back in the early history of the world the people had to contend with what was then known, as it is now, as the problem of the city. There are many problems in the city that the country people do not have to contend with. Those things are readily apparent when you stop to think about them. When you get large numbers of people living closely together the problems of government become more complex, more laws are required, more regulations are necessary and more precautions are necessary to make sure that one man does not impose upon another or trample upon the rights of his neighbor. That has always been the case in every country and in every age and clime.

Away back yonder we read that there were two men named Abraham and Lot. They were living out in the country and it became necessary for them to make choice between certain lands which they were occupying jointly to some extent at that time, and they amicably arranged that matter between them. Abraham said to Lot, "You just take your choice," and Lot did what a great many men do in this day and time. He made a bad choice by pitching his tent over near the city of Sodom. After awhile he drifted over into Sodom. He became a citizen of that city, and he found at that early age and day that the people of that city were up against the problems that confront this city today. Those problems there in that city were not settled by the intervention of God himself, except by fire. We are trying to settle them in Tennessee without fire, except the fire of public sentiment. The fire of public sentiment will be all that is necessary to cleanse the cities of Tennessee and to make their population realize that they are not what a certain newspaper of Nashville said—that they are not superior to the country people of Tennessee. That idea that one set of people in Tennessee is better than another is an idea that has to go, and it is going very rapidly.

The country people of Tennessee are now, have always been, and will always be the very backbone of the government of this State. Now, that is something that may be said by any demagogue in an address upon most any occasion, but when you come to think about it it is a solid and substantial truth. There has never been a time in the history of this State when a great question arose for settlement, either in times of war or peace, that the brunt of the battle, that the heat and the burden of the day did not descend upon the country people, the farmers of the State. That has been true in war and peace, and I trust that it may always be true, because the country people have always been willing to shoulder their part of the burden, both in public and private life. I do not mean that they are always naturally more patriotic than the people of the cities, but somehow I believe that the environment of the country is the best place to produce a man, a real man. I would rather raise my boys on the farm today than to raise them up in any city upon God's footstool, because man made the city and God made the country, and just as soon as I can get out of politics I have a little lurking ambition that I haven't said much about—I would like to get my own boys out on the farm, where they can get close to nature and close to God.

One thing I want to say about the people in the city—and I think

it is interesting to us as good people to talk about these matters—they are connected with country life and with city life and with the problems that confront the country people, the farmers of Tennessee. I want to say that the good people in the cities are entitled to more credit for being good and for living correct lives morally and religiously than the people in the country are, because conditions are harder for them. From observation, I want to say that I believe that some of the very best people in the world live in the cities, alongside of the very worst people in the world. It so happens that the worst element of society drifts towards the cities. Now, we have all observed that. About the triflingest fellows that you have out in the country drift to the city, along with some of the most enterprising men, who go to the cities to seek the great opportunities that they believe lie in the cities, and it happens that in every city there exists what is called a floating population. The people in the cities are not to blame for that condition. It is thrust upon them and they have to deal with it as they find it from day to day. Let me say that some of the most godly men and women, the most earnest men and women that I have ever seen in religious and philanthropic work, are some of the men and women who live in the cities of Tennessee. They have greater opportunities for this work than people in the country seem to have, because a greater number of people are brought right before them whose sin and vice, and whose poverty and suffering, are daily before their eyes. You country people do not see this every day.

So, when we talk about life in the country and life in the city, and when we compare the country people and the city people, I think it is well for us to remember that conditions, surroundings and environments are different, and for us to remember what I said at the outset—that folks are just folks wherever you find them and that the good people in the cities are striving just as hard as the people in the country are.

Now, we have been somewhat worried in the last few years by reason of the fact that there is a great trend of population from the country to the cities, which has caused the last Federal census to show that the population of the cities is increasing by a much larger ratio than the population of the country is. That is a problem that has caused some worry and concern to the people of the State. I believe, however, that it is a question that will right itself. I believe that the pendulum has swung just as far in that direction as it is going to swing. I have a hope that the increasing desirability of farm life is going to cause it to gradually swing backward during the next decade from the city to the country. There are many things upon which to base that hope. The main reason is that there is a decided tendency at this time not to take the country to the city, but to take all of the facilities, the utilities and the comforts of the city out to the farm. That is one thing that the farmers of the country and the farmers of the Middle Tennessee Farmers' Institute are trying to do. There is no reason why the farmer should be what he was fifty years ago—isolated and a social Robinson Crusoe, away from all the comforts of modern

life and civilization. I see no reason for believing that this condition should continue.

As I said a moment ago, I believe that the movement to bring all those things to the country will end this trend of population from the country to the city. Of course, the rural free delivery, the telephone, the electric interurban and improved highways are among the things that are doing this. They are keeping country people from feeling that they are cut off from the world, and keeping the young boys and girls from feeling that they must go to the city to see and learn what is going on. The people must have amusements. The bright, keen, eager minds of the country boys and girls must be fed on something. You cannot cut them off by themselves, you cannot seal them hermetically and expect them to live.

Another thing that I believe in very strongly, and which has been advocated by the Educational Department of Tennessee, by Superintendent Brister and those under him, and that is the consolidation of the schools of the State. Instead of having a half dozen, or a dozen, shabby schools in a country district, have one or two or three schools that are really good and make each school not only the educational center of that district but the center of the social life of the district as well, a meeting place of the people, old and young, of that country, where they can gather for pleasure and profit. When that is done, I believe that that will be another one of the factors that will help to keep the boys and girls on the farm.

Now, ladies and gentlemen, my experience has been that when a man speaks extemporaneously he speaks too long. Now, I must not speak too long this morning, if I haven't already done it, on account of the fact that I speak without preparation.

I want to say in conclusion that it is a great pleasure to me to welcome the Middle Tennessee Farmers' Institute, and I welcome you not only on behalf of the city but on behalf of the State. I trust that during your stay here the results that you obtain from your meeting may be beneficial. An exchange of plans, experiences and purposes is always good for men engaged in every line of business. There is no reason why farmers should not organize. Organization is the watchword of success, and organization is just as necessary to the farming population of the country as it is to any other industry in the country. I trust that you may profit from your meeting and when you have completed the work of the Institute that you may go back to your occupation with your ambition for progress and improvement greatly enhanced.

Now, with these words, ladies and gentlemen, I thank you for having listened to me, and I again thank you for this opportunity of looking into the faces of so many of the good citizens of the State.

THE ONE-DOLLAR FEE.

Commissioner T. F. Peck here asked for the floor, that he might make some announcements, which follow:

Commissioner Peck—Mr. President: Just a few words. I want to first state that the ladies are requested to meet in the Woman's Building, near the entrance to the grounds. They were asked to come up here that they might hear the Governor's address, and now they are urged by the ladies in charge to come down to the Woman's Building, that they may start their program. Before they leave there is one thing I want to get settled and get out of the way. At the Institute two years ago a resolution was passed requiring the payment of \$1.00 when the certificates were validated. That was an action taken by the Institute of its own accord. There has been some criticism, from various sources, of the Department of Agriculture, in the carrying out of the instructions of the Institute. Now, I want you all to understand that the Department of Agriculture gets absolutely nothing out of this \$1.00. It is the Institute's money, it is spent in broadening and enlarging the scope of the Institute. If you want it, we are willing to do the work; if you don't want it, we are willing to try to do it anyhow and have the Institute just the same. But the point is just this—I have been approached by so many, claiming that it retards the Institute, that people do not want to come if they have to pay \$1.00, and I want you to say whether you want to do it or not. I have even heard it said that they did not have to do it under the former administration, and I want to say that the present administration has nothing to do with it. I want you to settle this now. We are ready; we are your servants; we are simply trying to do the work you ask us to do to the best of our ability. I will ask for an expression from this meeting as to your pleasure in this matter. If you want to continue the payment of \$1.00 on the validating of certificates, instruct us; if you do not want it, we will gladly validate the certificates without it. It is your fund, it is your action, and do not blame us in carrying out your policy.

Motion was made by Delegate T. F. Perkins, and seconded, that the payment of the \$1.00 be continued. Motion prevailed unanimously.

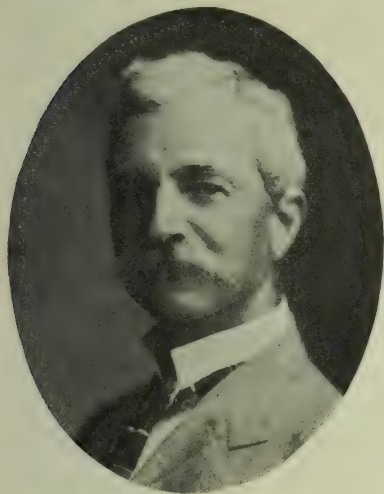
LUNCH ACCOMMODATIONS.

Commissioner Peck—Another thing I want to announce. We have arranged on the floor below so that you can get your lunch, or you can get your dinner and supper, for 25 cents a meal. We have arranged that you get a good meal, and we are making no charges to the people in charge of it, so that they can afford to give you your money's worth. You will get good service and it will make it convenient for you. You will not have to leave the grounds until after the night meeting unless you wish to. Our night programs are full of interest, and I hope you will give your full attention and study the program, and stay with us for a few days, for we want to accomplish something.

I want to announce, further, that at the noon hour, after the convention adjourns, the Boys' Corn Club exhibits will be installed. Professor J. R. Fewell is here in charge. You can get in touch with him at the noon hour and after the afternoon program.

RESPONSE TO WELCOME ADDRESS.

In response to the address of welcome of Governor Hooper, Mr. Sam N. Warren, of Spring Hill, made the address on behalf of the delegates. Mr. Warren's address follows:

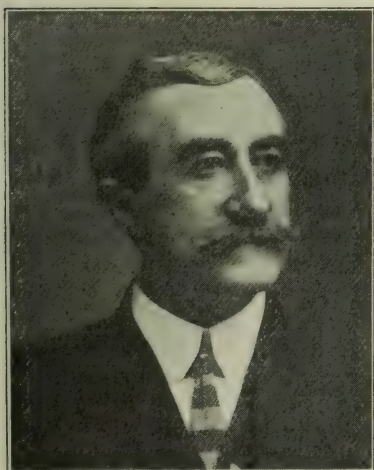


MR. PRESIDENT: It gives me pleasure, on behalf of this royal family of Reubens, Hayseeds and Hill Billies, to extend thanks to Governor Hooper for the hearty welcome he has accorded us. Also for his words of good cheer and encouragement.

For no matter who we are or what our station in life, whether as lowly millionaire bond owners, or lordly farmers and stock breeders of Middle Tennessee, we each have human nature enough in us to like and appreciate a pat on the back and a word of encouragement, now and then, as we travel the highway of life, each bearing his burden of bonds or bondage, as the case may be.

ANNUAL ADDRESS OF PRESIDENT.

At the conclusion of Mr. Warren's address, President Robert Gallagher delivered his annual address. Mr. Gallagher's address follows: *Gentlemen of the Middle Tennessee Farmers' Institute:*



It is with pleasure I greet you, and I sincerely trust each and everyone of you will learn something of value to you at this meeting, for every man woman and child in Tennessee has an interest in and is affected by what you learn here.

The attitude of the people toward farming and farm life and their estimate of them have greatly changed in the past few years, and I am glad to say the change tokens better things and better conditions of living for a large number of human beings.

The old-time idea of farming and farm life was that it was a dull, uninteresting routine of drudgery and hard work and only indulged in as a means of getting a living by people who could not make it any other way. For it was thought that anyone

could farm, as you did not have to learn how, and there was no science nor art about it. But this has all changed. Now we regard agriculture as the first great business of the world. And in these times of progress it takes education, science and art together, with persistent stay with it, to keep up with the procession of success. Now, instead of being astonished at meeting intelligent, up-to-date farmers and happy and contented farmers' wives and children, it is a matter of surprise and even sadness to meet any who are otherwise.

Agricultural prosperity is a familiar phrase. We hear it so often we do not really consider or appreciate the full extent of its meaning, yet it is a phrase which means plenty, comfort, contentment, strength, security and happiness to mankind.

But good farming is an indispensable requisite of agricultural prosperity, and there cannot exist anywhere permanent agricultural prosperity where the system of farming is of the kind that certainly, however gradually, lessens the fertility of the soil.

So it hardly seems necessary to warn so intelligent a body of men as compose the Middle Tennessee Farmers' Institute that those of you who do not take advantage of the opportunities offered to you to learn how to make more than a living out of your farms, but persist in raising crops and selling them off without regard to retaining the fertility of your lands, are slowly but surely selling your farms from under you and your families. The most practical method—in fact, I might say the only practical method—of maintaining the fertility of your farm lands is to combine live stock husbandry with your other farm operations, and when you begin this, read, study, improve your minds as to the best, most practical, most economical and profitable methods of breeding, feeding and handling the classes and kinds of live stock suited to your conditions, and you have taken a long stride towards prosperity from agricultural pursuits.

ADDRESS OF COMMISSIONER T. F. PECK.

At the conclusion of the address of Mr. Gallagher, Commissioner of Agriculture T. F. Peck was introduced, who spoke as follows:

FELLOW FARMERS: When I was appointed Commissioner of Agriculture, the thing that worried me most was the fact that I would have to do some public speaking. Up to that time I had never made an attempt to speak in public, so my appreciation of the honor that was conferred upon me was dampened by the fact that I would have to speak on occasions like this. I was not afraid of the other duties, but that was one thing that I did approach with fear and trembling.

Directly after I was appointed, the Farmers' Institute was held at Jackson and I knew what was expected of me, so I prepared a paper and when the time came I got up on my feet, my knees shaking, but I managed to read the paper, and while not satisfied with it, it seemed to pass muster. I decided, though, then that as much as possible I would avoid reading papers. At the noon hour one of the farmers

came up to me and said, "You are having a good meeting and we are enjoying it, but the next time you get speakers I wish you would get speakers who know enough about their subjects so that they can tell it without reading it off their papers." You remember Josh Billings said he didn't care how much a man talked, provided he said it in a few words. Governor Hooper this morning also commented on the fact that when a man talked offhand he is liable to talk too long. There are some things I want to talk to you about today on which I don't want to be misquoted, and for that reason I have prepared a paper, and am going to furnish you a short manuscript, so that the original will be in evidence when the matter is referred to in the future.



In planning our meeting here on the State Fair Grounds we had more than one object in view. First, we needed a larger assembly hall. We have that here. We needed to get farther away from the counter-attractions of the city. We do that by meeting here. We wanted to combine educational exhibits and demonstrations with our lectures. That is possible by meeting here, as you will observe by looking around the assembly hall. We meet here for the express purpose of increasing our knowledge of agriculture. If we do so we must concentrate our attention to the program arranged for this meeting.

If you will look at the program as it is arranged, the subjects to be discussed are of special importance to every farmer and no farmer can get the greatest benefit by dividing his attention between the discussion here and the attractions of the city.

As time passes we realize more and more the importance of a better knowledge by the farmers of modern, practical methods in farm practice. We see our population increasing without proportionate increase in production. We see the various enterprises other than farming demanding labor and, by their thorough organization and management, increasing the producing capacity of the labor they employ, so that they can afford to pay prices for labor that are prohibitive to the farmer who fails to intelligently direct the labor on his farm to increase its producing capacity proportionately.

In the past, and at the present, too many of our farmers, while they applaud the splendid system, thorough understanding and organization of the working force in public institutions, act as though it were not worth considering in their own business. Now, brother farmers, we must realize that, to be a success, farming must be given the same thought, the same thorough organization, the same attention to detail necessary in other lines of work if we hope to succeed.

This institute is planned for your benefit. There is not one subject on this program that will not well repay you giving it your careful attention, and the benefit you receive from this meeting will be in proportion to the interest you take in it.

We have had an unusual season this year for growing crops. While the rainfall has been about up to the normal and ample for the growing of normal crops, yet it has been irregular and we have been unprepared to conserve the moisture that has fallen, and our unpreparedness has cost us dearly.

Since I have been connected with the Department of Agriculture I have been emphasizing in every way I could the importance of deep plowing, turning under vegetable matter, subsoiling, thorough pulverizing, keeping a dust mulch on the land during the growing season and a cover crop during the winter season. Those who have done so have had a decided advantage over those who have not. They have conserved their moisture, they have made available plant food in their soil, they have prevented their land from washing, and just in proportion to the extent they follow those directions will their advantage increase.

We have some striking examples in several counties in Middle Tennessee where they have done the simple things suggested. There is not a farmer here today that cannot do so, and no one can do so without profit to himself in proportion to the thoroughness of his work.

Now, I know you cannot rightly cultivate as many acres as you can scratch over, but I can guarantee that you will get more crop and profit on the few acres you prepare and cultivate right than the many acres you scratch over and put in shape to wash away. I wish the farmers would realize that it is more profitable to them to pile up their acres than to spread them out; that there is more profit in cultivating one acre with ten inches of fertile soil than in two or three acres with five inches of hungry soil; that eighty acres of a deep, rich soil are more profitable to cultivate than 160 acres of a shallow soil, with an impervious hardpan to run off all the moisture that falls on it.

I wish the farmers of Tennessee would realize that their soils are siltmilar to their bank accounts—that if they take out of them all the time and put nothing back, it is but a question of time until they cease to be profitable to work.

I wish our farmers would appreciate the value of our climate and rainfall and profit by them as they should. Our climate enables any farmer who will to grow a money crop during the summer and a feeder crop for his soil during the winter.

Our rainfall is ample for our requirements for crop production if we would save it, but we must have a deep soil with plenty of vegetable matter in it to hold it. You cannot do it with shallow soil, devoid of vegetable matter, overlying a hardpan that water will not penetrate, but which, when the shallow soil gets saturated, will slough off and the little vegetable matter in it get away.

I wish our farmers would do the simple, practical things they can do, before they waste time trying to solve problems they are not ready for. Do not worry about soil analysis until you have made available the plant food in your soil. Then, by an examination of your crops, you

can better tell the deficient elements of plant food than by a soil analysis, because your soil does not run uniform. One hundred samples taken from one hundred different places in a ten-acre field, would each vary in plant food. If we will turn under vegetable matter, and subsoil, we will find we have made available plant food ample for profitable crop production and much cheaper than by an injudicious use of commercial fertilizer.

Thousands of dollars have been wasted by Tennessee farmers every year by the unintelligent use of fertilizers, not because the fertilizers were not all that was claimed for them, but the farmers using them did not give the fertilizer a chance to feed the crop. I do not care how good the fertilizer may be, the soil conditions must be right to make the fertilizer available for plant food. The soil must have sufficient moisture to dissolve the fertilizer, and the soil must also be thoroughly pulverized and there must be moisture sufficient during the growing season. Some people have an idea that the poorer the soil the more fertilizer they should use, while, in fact, the better your soil is supplied with humus and moisture you can proportionately increase with profit the use of fertilizer, while the poorer the soil the more sparingly should fertilizer be used.

Now, brother farmer, I have just stated in a terse way some facts that every farmer should know and put in practice. If they would do so the agricultural production in this State would more than double in two years.

There is one more fundamental principle of agriculture that I want to emphasize, and that is, we must cultivate the soil to grow crops to feed animals to feed the soil—thus completing the agricultural cycle—a law of nature that cannot be violated without paying the penalty of depleted soils and decreased crop productions. We are paying that penalty now and will until we grow more live stock on our farms.

Now, a final word, brother farmer, about politics. For two years the Department of Agriculture has kept out of politics, but I want to tell you right now that we are going to have considerable to say about politics for the next eighteen months, and we expect the united cooperation of every farmer in our efforts. Now, be sure that you understand me right.

Agriculture is the basis of all our prosperity. On the farmer depends the general prosperity of all our citizens. For that reason the agricultural classes ought to have every possible practical help and assistance. Are they getting it from our state and national governments? If so, I want you to show me. I am here to tell you that the Tennessee Department of Agriculture for the first two years I was connected with it not only did not cost the general taxpayers of the State one cent, but instead paid into the treasury for the two years \$50,000.00 in cash.

The Legislature each two years fixes a budget for expenditures of the funds collected by the Department of Agriculture for inspection fees, and the excess of this fund over the budget for the past two years is paid into the general fund and is lost to the farmers who pay it, and no matter what develops that requires funds to carry through for

the development or encouragement of agriculture of the State, the funds are not available.

There has been much valuable information worked out that the farmer should have the benefit of. Much of that information is not in available form for the small farmer who has not had the benefit of an agricultural education. This can be done by practical demonstration under conditions similar to those the small farmer works under. The county demonstration farm is the practical solution for disseminating the information. A bill was prepared and introduced at the last regular session of the Legislature providing for the establishment and operation of such farms, and which would not cost the general taxpayers of the State one penny, and would have done more than anything to stimulate the masses of the farmers to better methods and increased production. The few representatives alive to the interest of the farmers supported it actively, but too many were indifferent to the farmer and his real needs, and the bill failed to reach third reading and become a law.

Do you farmers, who are the backbone of the State's prosperity and progress, propose to remain indifferent and allow the agricultural interests of the State to be ignored?

Now, I am ready to tell you what I am going to have to say about politics between the present time and the election of representatives to the next Legislature. I propose to appeal to the farmers of Tennessee to see to it that the representatives to the next Legislature are men who are interested in the development of the agriculture of the State and will take an active part in providing the necessary legislation to guarantee a more liberal policy toward the Department of Agriculture. I am for the man who is big enough and broad enough to provide for the development of the industry that is the basis of all our prosperity. I propose to encourage the farmers to rally to the support of men who can be depended upon, who announce a platform of encouragement to the agricultural interests of the State.

Understand, I am not and do not expect to be a candidate for any office. I have no political aspirations, but I want to see Tennessee, the most favored State in the Union by nature, develop her agricultural resources as they should be, for when that is done she will be in the front rank of prosperity and happiness for all our people.

It would be ingratitude on my part if on this occasion I failed to acknowledge the hearty cooperation with the Department of Agriculture of the railroads and the newspapers. Their cooperation has more than doubled the efficiency of the work of the Department of Agriculture since I have been at its head. With the meager appropriation given the Department of Agriculture very little progressive work could have been done but with their help. I think you will agree with me that more interest has been aroused in better farming methods than ever before in the past. The railroads and the newspapers I regard as the greatest factors in the State's development in all lines, and I want you to know that both have willingly lent every assistance on every occasion, and they are entitled to much praise and fair treatment at our

hands. We can well afford to be liberal with the newspapers, and will be thoroughly justified in expressing our supreme contempt for the demagogue politician who hopes to ride into popularity by trying to cripple the efficiency of the railroads by encouraging unjust legislation against them.

In conclusion, I want to assure you that I am much gratified by the interest manifested by the farmers all over the State in better methods in farm practice. The farmers are beginning to realize the possibilities of their soils for crop production. Old standards have been discarded and new ones established. New methods are taking the place of antiquated ones. Farmers are taking more pride in their vocations. They are taking more interest in better roads, better schools, better churches, and more comfortable homes. This will all result in keeping the boys on the farm, and when the brain and the brawn that has been leaving the farm remains there, and is utilized under more favorable conditions, there need be no uneasiness about the future prosperity of the farmer or the general prosperity of the people of the State.

GOOD ROADS MOVEMENT.

Mr. J. E. Kavanaugh, of the National Good Roads Association, made an interesting address on "Good Roads."

ANNOUNCEMENTS.

Captain T. F. Peck—I hope you will not get tired of seeing me up here so much, but I want to announce that the health exhibit you see over in the corner merits your looking over, and they have some literature there that is very valuable. It is done up in bundles, one of each kind, so that it is convenient to carry. We cannot do our best unless we are healthy, and these organizations are helping us along these lines and they will appreciate your looking over the exhibit and taking some of the literature home with you.

In this connection I might also state that we have a number of bulletins here from the Department of Agriculture, and I want every delegate to the convention to take home with him a copy of last year's proceedings.

There is also here, for the benefit of every farmer, the Agricultural Laws of the State, compiled in convenient form. No one need be ignorant of what the laws are, because they are here.

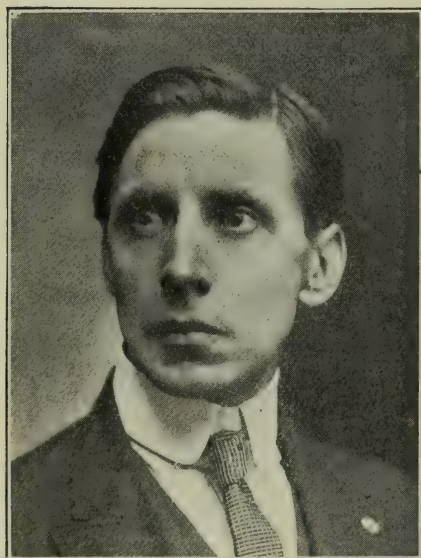
There are also a few copies of "Facts About Tennessee." There is one thing that Tennesseans need to know—more about Tennessee. If Tennesseans in the past had been better acquainted with other portions of the State, we would have had the money, brain and brawn that have gone to make up the States of the Southwest, and the reason that we have them not is the fact that the people were not acquainted with what we have here in the State. This little booklet will be an eye-opener as to many of the resources that we have.

During the noon hour there will be an opportunity to get your

dinner on the grounds, and, before you get away, look over the program. You need not go to town to a moving picture show, because we are going to bring the moving picture show out here tonight. Dr. White and Dr. Kiernan are going to manipulate the machines. Keep in touch with the program. I hope to see every available seat in this and we want you to get a little better acquainted with your property; hall taken. These Fair grounds belong to the farmers of Tennessee, get better acquainted with what the State Fair means. The Tennessee State Fair is going to be one of the biggest educational institutions in the South.

Arrangements have been made at the Secretary's office for the certificates to be validated. We want you during the intermission to go there and have your certificates arranged for your return. You can bring your certificates and have them validated at any time, but read them carefully. You will find that they are not good for return until tomorrow afternoon.

REPORT OF SECRETARY T. G. SETTLE.



TO THE PRESIDENT AND DELEGATES: The minutes of the last meeting of the Middle Tennessee Farmers' Institute, held at the State Capitol in Nashville, on December 3, 4 and 5, 1912, appear in printed form. A large number of these volumes are at the desk and the delegates are invited to help themselves.

Four thousand of these copies were printed and mailed out to the delegates in attendance on the last meeting. Owing to the rush of validating the certificates for return at the last meeting, the post-office address of many of the delegates could not be ascertained and all could not be sent copies.

At the last meeting of the Institute there was collected on—

Validation of certificates.....	\$2,422 25
Paid for printing, etc., of proceedings.....	\$914 82
Set aside by resolution for the use of Homemakers' Section	250 00— 1,164 82

Leaving at the present time to the credit of the Institute.....\$1,257 43

Of this amount, \$250 was voted by resolution at the last meeting of the Institute to the Seaman A. Knapp School of Country Life. This has not yet been paid to the trustees of that institution. When deducted from the amount now on hand, it leaves \$1,007.43.

A register has been provided in the office of the Secretary and every member is requested to register his name and postoffice address in order that a printed copy of the proceedings may be mailed to the proper address.

Of the amount set aside for the use of the Home-makers' Section of the Institute—\$250—there has been expended the following amounts:

Mrs. Rose Nipher, expenses as lecturer.....	\$ 60 00
Premiums in Better Babies' Contest at the State Fair.....	50 00
Mrs. Myra Tandy, postage.....	5 00
Cullom & Ghertner, printing.....	36 90

\$151 90

Leaving a balance in that fund of.....\$ 98 10

Respectfully submitted, T. G. SETTLE, *Secretary*.

BOYS' CORN CLUBS.

Professor Fewell was called upon to make announcements regarding the Boys' Corn Clubs, after which the convention adjourned until 1:30 P. M.

AFTERNOON SESSION.

At 1:30 o'clock the convention was called to order by President Gallagher.

ANNOUNCEMENTS.

Captain T. F. Peck, Commissioner of Agriculture, made the following announcements:

In planning the Farmers' Institute for this place, having it at the Fair grounds instead of the Capitol, we had one object in view. I don't know how far it is going to develop this time, but I believe when everybody understands it it will be very popular for the future of the Institute. One of the important things that the farmers of Tennessee need to know more about and engage in more extensively is improved live stock. Now, out here we have splendid stall room for live stock. We hope to get the breeders of improved live stock to bring their stock here. If you will notice the program as it is planned, we take up the question of swine breeding. We want a thorough discussion and demonstration, and those who are interested in hogs will have opportunity to discuss them freely. Tomorrow we take up the question of dairying and beef cattle, and we want each day to have some feature live stock, with demonstration, and give the farmer all the specific information so that he can investigate this more intelligently. Now, we offer to give free stall rent to any breeders who want to bring their stock here that the farmers may see them. We are going to have a splendid exhibition of draft horses here and we are going to have that subject discussed. I think it would be a great benefit to get the breeder and the farmer closer together, and that was one object in bringing the meeting out here.

APPOINTMENT OF COMMITTEES.

The following committees were appointed by President Gallagher:

Committee on Resolutions—S. M. Young, Smith County; John M. Davis, Maury County; C. C. Hedgecothe, Cumberland County; L. P. Bellah, Davidson County; J. G. Warden, Coffee County.

Committee on Nominations—John Davidson, Lincoln County; T. F. Perkins, Macon County; J. B. Abernathy, Giles County.

Captain T. F. Peck requested that these committees report not later than Thursday morning.

The President then introduced Dr. White, who spoke on the subject of Hog Cholera in Tennessee. His address follows:

HOG CHOLERA IN TENNESSEE.

MR. CHAIRMAN AND GENTLEMEN OF THE INSTITUTE:



I am before you this afternoon to discuss hog cholera. Now, hog cholera is a question in which every man in this audience is interested, either directly or indirectly.

We have in Tennessee 1,386,000 hogs, according to the last Federal census. Those hogs are worth \$7,330,000. Hog cholera killed in this State last year not less than 400,000 hogs. So any disease which kills as many as 400,000 hogs, valued at \$2,500,000, in a State as small in area as Tennessee certainly deserves all the consideration that you people, as well as the State Department of Agriculture, can devote to it. Remember that hog cholera

is a very contagious disease. It is similar in many respects to typhoid fever in people. The symptoms of the two diseases are almost identical. Therefore, it is logical to conclude that cholera in the hog and typhoid fever in man are almost identically the same disease.

Up until about five years ago the hogs of this State, and all other States, were at the mercy of this disease—hog cholera. By this I mean that up until then there was absolutely no means of curing hog cholera or of preventing hog cholera except by improving the sanitary conditions on the farm. About five years ago Dr. Marion Dorset, with the aid of Dr. W. B. Niles, discovered the Dorset-Niles anti-hog cholera serum. It is more to discuss and to talk to you people about the uses of this serum than any other features of hog cholera that I am here today. We are here to learn all we can about this disease, and you people are at liberty to ask questions at any place you like. I will stop and try to answer them as best I can, and in this way it is possible to bring out valuable points.

The last Legislature was appealed to and they passed a bill providing an appropriation of \$10,000 to establish and equip an anti-hog cholera serum plant for the purpose of distributing anti-hog cholera serum to the swine owners of Tennessee at the cost of production. This plant is now in actual operation. It will only be a few weeks from now until this anti-hog cholera serum will be available for all you people who raise hogs in this State.

Remember, first, that up until five years ago there were many fake remedies recommended throughout this country which claimed absolutely to "cure" hog cholera. Those remedies were absolute "fakes" and frauds. Gentlemen, there is absolutely no medicine that has ever been prescribed that will "cure" hog cholera. Since this anti-hog cholera serum has been discovered many "fake remedies" such as "vaccines," "anti-toxins," etc., have been placed on the market, and it is for that purpose more than any other that the State is preparing to manufacture anti-hog cholera serum. It is in order to assure you people of a *reliable* anti-hog cholera serum.

It is well enough to know something about the administration of this serum. First, the serum is obtained in bottles of different sizes. The largest bottle which we purpose to put up is in the neighborhood of a pint. It will be put up in bottles as small as an ounce. This serum may be injected into healthy pigs at the time they are weaned and these pigs may be put with hogs which die of cholera and they are absolutely protected against the disease. Now, gentlemen, if the serum is what it ought to be and is administered in a sufficient dose, this is about the result you can expect of the serum. If the serum is made in a reliable and trustworthy manner and is administered in the proper dose, it will certainly protect your hogs.

Now, the time to use the serum is when the hogs are small. They take the serum in proportion to their weight. If you wait until the hogs are full grown, it will take about \$1.25 worth of this serum, and you have absolutely thrown away \$1.00 of that money, because you waited until that hog was grown to vaccinate him. The time to do this is when these hogs are pigs. At this time it will take about 15 or 20 cents' worth of anti-hog cholera serum, and then you get the protection of that pig for life.

It is well enough to remember a few ways by which hog cholera is spread, because it is necessary, especially when the serum is not in use, to know how hog cholera is spread in order for a man to prevent the outbreaks of hog cholera on his farm. Remember, first, that the public stock yards are great disseminators of hog cholera. You should never think of going to public stock yards and buying hogs to carry to your farm for breeding purposes. The only place for a hog of that kind is directly to the abattoir for immediate slaughter. Public roads are disseminators of hog cholera. Hogs infected pass along the public roads and you allow your hogs access to the public roads, and they are liable to become infected. Running streams are also disseminators of hog cholera. People above you may throw hogs that died of cholera into these streams. The turkey buzzard is also a disseminator of hog cholera. These buzzards may devour the carcass of a hog that died of

hog cholera above your place and then gather around a carcass of some animal on your place, and your hogs are liable to become infected in this way. Some people think that this buzzard is protected by law, but that is a mistake. The law protecting the buzzard has been repealed and any man can kill a buzzard without violating any law. You people should do your best to exterminate these buzzards.

If you never buy hogs from public stock yards and keep your hogs off public roads and away from running streams and bury or burn the carcasses of all animals which die on your farm, you will never have many cases of hog cholera, even without the use of the anti-hog cholera serum.

I think it is well for me to show you people something about the technique of vaccinating hogs. This vaccinating proposition will be popular three or four months from now, whether it is popular now or not. You will hear much of it within the next few months. We had hoped to illustrate this proposition, but cannot use the lantern on account of the daylight.

(A demonstration followed, in which a stuffed pig was vaccinated.)

This serum can be injected within three or four minutes by anyone, and it is not necessary for a man to have much training in order to use this anti-hog cholera serum successfully. If the serum alone is used, you get the protection of this pig for about six or eight weeks. We want more protection than this; we want the pigs protected for life against hog cholera. After this serum is injected in one side you should take another syringe and inject on the other side about one-half to one and one-half cubic centimeter of blood from a hog ready to die of cholera. That is the only method by which anti-hog cholera serum can be used successfully. This blood will be furnished free with the serum, and we do not propose for any man to use this blood in Tennessee unless he gets a special permit from the Tennessee Department of Agriculture, because it is dangerous to use it without instructions. It is necessary for him to have some special instruction. We intend to have a man at this anti-hog cholera serum plant for this purpose. The plant will be open 365 days in the year, and the hog raisers of Tennessee are welcome to come to this plant at any time and receive instructions. Gentlemen, when we refuse to send you this blood to use, when we refuse to issue this permit to use this blood, remember we do it for the protection of the hog raisers of the State. All you have to do to get a permit to use the blood is to come to the plant and get instructions.

Now, I would like to answer any questions that you people would like to ask about hog cholera or this anti-hog cholera serum. If there is anything that is not plain, now is the time to make it plain. I believe right now would be a good time to straighten this hog cholera proposition out. Hog cholera is the only disease that has killed many hogs in Tennessee within the last twenty years.

A general discussion of hog cholera and anti-hog cholera serum followed, in which the delegates asked many questions, which were answered by Dr. White.

Dr. A. H. Purdue, State Geologist, was then introduced and delivered an address on "The Education of and for the Farm." His address follows:

THE EDUCATION OF AND FOR THE FARM.



GENTLEMEN: I ought to say, I suppose, that my place on the program is the last day of the session, but as I could be here only today others on the program have given place to me. All of you know that the speaker who follows Dr. White is always put to a great disadvantage, especially in talking to the Farmers' Institute, because he knows so much about the stock on the farm. My paper is very different, being abstract and general in its nature.

If what I shall say fits the subject, it plainly must consist of two parts: The education *of* the farm, and the education *for* the farm.

Not all education is secured in the classroom or from books. Indeed, the education from these sources consists in the shaping up, the rounding up, the polishing up, or the refinement of the equally important education from other sources. I once heard a university professor say that the educated man is the one who can see an opportunity and take legitimate advantage of it. If this definition sounds mercenary or selfish, and a broader and more philanthropic one is desired, we can revise it somewhat and say that the educated man is the one who can see what ought to be done and how to do it legitimately. There is the education of the shop, of the store, of the office, and of the farm. What is the education of the farm? Whatever this is, there must be something unique, something potent about it; for if the common assertion that a majority of the men who are leading the affairs of the country came from the farm is not true, it certainly is true that the farm is the source of a very large per cent of them. It would appear that there is something in the training on the farm that leads to success or, better, to usefulness. The features of this training that are educational is a matter to which I have given some thought and shall briefly state the important ones.

In the first place, the affairs of the farm are conducive to industry. There is something to do every work day of the year and every hour of the day. If the farmer is a successful one, certain things must be done today. They cannot be put off till tomorrow; and if he is doing a thing today that should have been done yesterday, it only is because he could not get to it then. The work of the farm is so varied that there is something for everybody to do, from the father and mother down to the boy of eight. The family on the farm is a hustling, indus-

trious institution in which the boy from childhood is one of the active participants and its influence early comes to be an abiding part of his character.

Again, the boy on the farm soon learns that all-important lesson of sticking to a disagreeable task. The professional or business man must needs go to his work without his small boys. They cannot assist him and he is too busy to have them about. He leaves instructions for them to do small jobs about the premises only to learn on his return that they are not done, or only slovenly done. Even if the boy in town is disposed to work, his neighborhood is full of boys with nothing to do, and these collect about him like those about Tom Sawyer. It takes two men to get any work out of a town boy; one to keep him at the job and show him how, and another to keep the neighbor boys away.

But the farmer goes early to the field with his sons and stays with them, giving such instruction as they need and keeping them at the work till noon. After dinner they return and stay till "quitting time." They do this day in and day out, season in and season out, the boy ever under the watchful eye of the father, who not only sees that the work is done, but done well. The farmer boy cannot quit his job when he gets tired of it.

It must be understood that I have in mind good farmers. I doubt if any man of marked ability ever grew up on a farm where the work was slovenly done. For a boy to get training from the farm, as from anywhere else, he must be taught to do his work well. If he plows, it must be deep and close, and the weeds must be turned under. If he lays off corn rows, they must be a uniform distance apart. If he builds a fence, it must be straight. If he hangs a gate, it must be plumb. If he uses a hoe, the work should be done neatly; if a scythe, the "heel should drag the ground." He must learn to harness a mule, to "set" a plow and to watch the mowing machine that all parts be kept properly adjusted. These may seem like commonplace things, but I tell you they have in them just as much educational value as mechanical drawings, cube root or the conjugation of Latin verbs. This is said advisedly and without at all disparaging those things that are commonly considered as having a monopoly of education. My only point is that those things usually considered drudgery are among the best agents of education, and every successful man from the farm owes far more to them than he may suspect.

Traits developed on the farm of no small importance are those of self-reliance and resourcefulness. The large family of children on the farm demand far less attention from the mother than the small one of the city. The household affairs of the farm require that the children early learn to shift for themselves. That is, on the face of it, a small thing, but by it they acquire the habit of independence that stays with them through life and helps them out of many a hard place. After they are old enough to go to the field, the breaking of the harness, a plow beam, a binder, demands repairs with the least possible loss of time. There is no harness shop, blacksmith shop or hardware store at hand and repairs must be made as best they can. This develop-

ment of his resourcefulness in after life may successfully guide a bank through a dangerous panic.

Of no small importance is the habit of economy that the farm forces upon the boy. The farmer knows that a dollar comes to him only through hard work, and the boy early learns the same lesson. If the farmer has any surplus money, it goes to the bank, is loaned out or is invested in land or stock. He does not have much loose change in his pocket and consequently is not able to hand out a dime to his son every time the latter thinks he needs it. Besides, there are not the opportunities on the farm for spending the loose dimes that there are in the city. The life of the farm requires no street car fare, calls for no soft drinks, and demands no picture shows. The ever-present opportunities for the city boy to spend money are the misfortune of the country boy only on such rare occasions as he goes to town. And then, knowing well that his few dimes have come through his own hard work or that of his parents, he thinks twice before he lets them go. The habit of economy thus early instilled into the country boy stays with him through life, and, next to industry, is the most important factor in his business success. Is it too much to say that this habit has developed the financiers of our country?

Consideration of the educational advantages of the farm would not be complete without mention of the physical development it affords. The farmer boy is "early to bed and early to rise." The late hours and irregular habits that retard the development of bone, muscle and nerve are not a part of his daily routine. His work develops sturdy fibre, causes deep breathing and ample lung expansion and begets an appetite for the wholesome food of his mother's table. The pure air of the field and the sunshine of the heavens are his. He needs no gymnasium or athletics teacher. The ax, the hoe, the plow and the swimming hole are far better than their substitutes, the punching bag, the running track, the horizontal bars and the swimming pool.

Very briefly have I stated what seems to me the prominent educational features of farm life. There are many others of minor importance that might be taken up, but their mention would make my talk tedious and most of them will occur to you.

So much for the education *of* the farm. A few words as to the education *for* the farm. It goes without saying that the principal education *for* the farm is the education *of* the farm. Any man would rather turn over his farm to an intelligent, sensible, well-trained farm boy without the "book learning" than to put it in the hands of a young man with the "book learning," but without the practical knowledge that comes with having been brought up on the farm. That is to say, the boy reared on the farm has a much better chance of becoming a good farmer than the boy who has grown up in the store, shop or office.

But something more than practical experience is rapidly becoming necessary for a successful farmer. The practical knowledge acquired on the farm must be supplemented by the scientific training of the school, if the farmers of the country are to continue to feed and clothe the rest of our population.

The thing that I wish to insist upon is that this school education must be thorough. The farmer and his son must outgrow the idea that it required only a year or two to fit one for the business of farming. The fact is, there is more to be learned in the preparation for farming than there is in the preparation for most of the professions; and after the boy has received his college education and goes to the farm, if he is wideawake he will see more to engage his study than the professional man sees.

In seeking to meet the demand for quick preparation for the farm our agricultural schools have not heretofore demanded the thoroughness of training that they know is necessary for the best results, for the reason that they have had gradually to educate the public up to a recognition of the high standards that must ultimately prevail.

In the line of general education the farmer should be well grounded in the English language. He should know how to express himself well, both orally and in writing. For the enjoyment of his leisure hours he should be able to appreciate good literature. When he has anything worth communicating to the public, as the wideawake, intelligent farmer will have, he should be able to put his thoughts in good manuscript form for the printer. Certainly the general education required by two or three years' study of English in college should be his.

Then he should study the various sciences: Physics, chemistry, zoology, botany and geology. No one of these can be omitted from his course if he is to be a well-prepared farmer. I do not mean that he should be an authority upon these subjects, but I wish to emphasize that he must have a good working knowledge of them. There is no science of agriculture as such. What is known of agriculture is a composite of the above named subjects. Any treatment of soils involves chemistry and physics. An intelligent understanding of every tree or plant grown on the farm requires a knowledge of botany. The successful growing of stock necessitates the knowledge of physiology and related subjects that can come only through a good general knowledge of zoology. The origin of the soils, the kinds of soils, the preservation of soils, the question of water supply from springs and wells and the matter of building sites and many others can be understood only from a knowledge of geology.

So when the farmer sends his boy "off to school" to study agriculture, let him do it with the understanding that the boy is leaving home to take not less than four years' hard work in the study of English and the sciences named, and not with the understanding that he is to take a year's course in agriculture. If he gets the sciences named with the necessary courses on their general application to agriculture, he is then genuinely fitted for beginning his work as a farmer. Otherwise he is only partly prepared for his work.

Motion was made by Mr. Bryson and duly seconded that the thanks of the convention be extended Dr. Purdue for his paper. The motion prevailed.

Prof. L. R. Neel, of the Southern Agriculturist, delivered an address on "Swine Feeding." His address follows:

SWINE FEEDING.

MR. CHAIRMAN, LADIES AND GENTLEMEN:



On the subject of hog feeding there are lots of things that we might discuss that will bear only on the future, but I will try to take it up as we are prepared for it. There are a good many things that might be the very best, but we are not in position to talk them right now.

The grain feed for the hog now is corn. We have lots of grain that hogs can use, but the grain food in Tennessee is corn. The other grain feeds can be used with profit. This question, I believe, will come up with a good many farmers this year. Many will have to buy corn who have not been in the habit of doing it, and they will find corn

higher than it has ever been before. If corn should go to the point where it is higher per bushel than wheat, then we would do better to use wheat. Corn and wheat have about the same value per pound if they are ground. If they are fed whole the wheat will be wasted.

Here is another point—a hog likes variety, so that a mixture of two grains is better than one grain by itself. If we had 200 pounds of corn meal and 200 pounds of wheat meal, or cracked wheat, that would be 400 pounds of cracked wheat, and we would get better results than if we fed the two separately. Now, the same thing is true of barley. It has about the same feed value as corn, but if you bring the two together you can increase the feed value of both of them. Therefore, if barley were sold for about the same per pound as corn, we could afford to grind up some of our barley and use it.

Now, with rye and oats, about the only way we can afford to feed them to hogs is to pasture them off. We have some other feeds that we can use to some extent for hogs. Really, corn is selling for as much or more than wheat, but the hog can grind the corn better than he can the wheat and barley, and for that reason we have to add the expense of grinding the wheat and barley. "Just" feed is good for hogs and is very easy to get. This can be fed with corn, one part of a "Just" package to about ten or fifteen of corn will be about right. It would be better if the corn were in the form of meal and mixed with it, so that the hogs would get it quickly. You can see that in that small proportion, making a tenth or a fifteenth part of the ration, it is very easy for one hog to get more than his share, but "Just" feed is good if it is fed properly.

Another feed that is good is cottonseed meal, but I will not recommend that, because it is dangerous if fed too near the breeding period. Since the period for its use is so short, it is not an ideal feed for hogs.

Shorts and bran are very good. Shorts are high, but they are not as high as corn. If you mix the shorts and corn together you get a better feeding value per pound than if they are fed separately. Shorts have a higher feeding value than corn, and then when you mix it with the corn it will increase the feeding value of the corn. Bran is not so good because it is too laxative a feed for extensive use. But the "Just" package, shorts and cottonseed meal, used as I have suggested are the main feeds under the conditions I have named.

These are the things we can take up now and use, but the main thing is the fact that the hog can graze out and have something to harvest for himself. You cannot produce hogs with corn alone. Corn is not an ideal feed for hogs, because it costs too much. There must be a certain balance in the food that goes to make bone and muscle. Corn is weak in two of these, in the part that goes to make lean meat and bone. If you undertake to develop hogs on corn alone without anything else, you will not have good bone. The best way that can be done is to feed them clover and peas and soy beans and other vegetables.

I have lived on the farm and know it is hard to have so many irons in the fire, and we should decide on a few good feeds, but always have something for the hog to graze on and he will have something to harvest for himself.

Another thing we do not realize—we do not appreciate the value of the hog yet in increasing the fertility of the farm. We do not appreciate farm yard manure yet. We feed the hogs in a little pen, barnyard or something like that and the farm gets no benefit of that fertility. My observation has been that the fertility from feeding hogs does not go back on the farm. That is clearly a big loss we are sustaining. If we will have pasture crops for the fields, the fertility will go back on the farm. The man who feeds 100 bushels of corn on his farm and has fed it right has fed to that farm \$25 worth of fertility. For the sake of saving expenses we cannot afford to lose that fertility.

Now, to mention some of the crops that we can use for grazing with profit. The red clover, I think, is one of the very best, to take it as a standby. Of course, alfalfa is a better crop, but it is not so easy to have. It is harder to get and it does not stand grazing so well. Now, the red clover is not a perfect pasture, in that it does not furnish the hogs grazing all the year, but if we have a good clover pasture it will give a pasture nearly all the year. We find that we cannot have a pasture quite all the year, anyway. I believe the next thing I would mention after red clover is crimson clover. You can sow that in October and the clover will begin to come on by February. Considering the hardiness of the crop and the adaptability to our conditions, I do not think there is a better pasture. Alfalfa is not as easy a crop as this I mention.

The permanent pasture is, of course, good. These pastures should

be in rotation. It is more expensive to have them fenced in small lots, and, as far as possible, I think, you should use the pasture of the farm, having hog-proof fences. Let the corn be fed on the fields where the fertilizer is needed.

Next to red clover are crimson clover and barley, and next to crimson clover and barley, I think, is a permanent pasture. We may find times along in the summer when the red clover is not so good and they can get some grazing off the blue grass and white clover. With those three kinds we will find the year is pretty well filled. There are some times in mid-winter when we cannot get good pasture. The permanent pasture ought to be on the farm anyhow and ought to have a hog-proof fence around it.

Now, when one gets out of the basin and on the freestone lands, the best pasture grass along with Japanese clover will be about the best permanent pasture he can get. If he will prepare the lands right, he can grow crimson clover there, but blue grass and wheat will not do so well. With those permanent pastures we can produce hogs for the future as we are producing them now using corn.

A man ought to realize that every time he throws out a bushel of corn to hogs in a dry pen that he is practicing a bad policy; that he is losing fertility to his land and he is not making the best bone.

Now, other crops that we can well use with profit, but not like grass, are the peas, soy beans and peanuts. In Alabama they are producing hogs costing about 3 or 4 cents per pound with peanuts. They are better adapted to peanut growing than we are. They can plant them later, but still we can grow the peanuts with profit. I believe we can find soy beans more profitable here. While corn was costing 7 and 8 cents peanuts were costing 3 and 4 cents.

If I were going to build up a poor farm, I do not believe I could think of a cheaper and a better way than to grow crops and let the hogs harvest them on the lands.

ANNOUNCEMENTS.

Captain T. F. Peck.—LADIES AND GENTLEMEN: There is one thing you do not want to lose sight of: This is your Institute. We want you to do your share of the talking. The speakers that we select to come here are not supposed to know all that is known about agriculture. This Institute is for the exchange of ideas and experiences, and we want anyone in the audience who has anything good to offer to give it to us. Agricultural science has been developed by the practical experience of those actually engaged in the work. These meetings are for the exchange of that experience.

Tonight we are going to have something entirely out of the ordinary at Farmers' Institutes; we are going to have a moving picture show. We are going to have two full reels that have been prepared at considerable expense. We are going to have them here for your benefit, and it will illustrate things in a way that you have been hearing about at the Institute. Tomorrow, you can see from the program, that every minute of the time will be filled with something good. I would like to see

the farmers assembled get on their feet as often as they like. I want the farmer to feel that it is his meeting. It does a fellow good once in a while to get on his feet.

Our President, Mr. Gallagher, asked me to announce that the Committee on Resolutions would meet in the Secretary's office tomorrow morning at 9 o'clock. I did not have any instructions as to the Committee on Nominations. That is composed of men who are present and they can get together at a time convenient to them.

I see in the audience Mr. James Palmer, who has made a trip to Europe to study the rural conditions there. We would like to have a short talk from him.

ADDRESS BY JAMES PALMER.

Mr. Palmer's address follows:

MR. CHAIRMAN, LADIES AND GENTLEMEN: •

It was my good fortune to receive the appointment of your Governor to visit Europe. I gave a good deal of attention to good roads. I attended, perhaps, the best good roads meeting that was ever held in the world: that was in London in June. There were representatives there from all parts of the world, but as I am down for a good roads speech later I will leave that and tell you about other things. I met many delightful people. I attended a great many banquets, where I met the lords and dukes. Let me tell you, some of them are very commonplace. Some of them are very dull in intellect, so far as I could see. They were not like our American people.

To show you the condition of the people over there, I will state to you that the city of London is owned by 24,200 people. There are 7,000,000 people in London and 24,200 people own all of it. Now, in Nashville we have 150,000 people and there are 16,250 who own all of Nashville. I can see the effect of this large ownership, the effect that it has upon the people. I talked with the farmers and I found that they were making just a bare living, as they had been doing for years. They were not bright like you see in Tennessee. I was talking to young Mr. Hankins today, and it was refreshing to hear that young man talk. You do not find that in England. They are not equal to the American people, and they will have to get out of that rut if they ever amount to anything.

To illustrate, I will tell you a little joke that was told me. A man went to the circus with his wife and nineteen children. They remained on the outside, and the man who owned the show says: "Why don't you come in?" The man says, "Why, here is the missus and our nineteen children with me. I can't come in." The show man said, "You got nineteen children! Well, I'll just bring the elephant out to see you." Here is another little joke I heard. This was told in the presence of an audience of 2,000 people; perhaps one-half of them were ladies, and I guess it is all right for me to tell it here.

A fellow in an automobile went to one of those country inns and ordered his dinner. Among other things he told the waitress he wanted her to serve him tomatoes and serve them undressed. Directly

she came back with apparently nothing but a skirt and corset on. She brought the man a big dish of tomatoes. He looked at her in astonishment and asked what this meant. She replied: "You told me to serve you tomatoes, and serve them undressed, and the Missus told me not to take off another stitch." I only tell this to illustrate, in a general way, just about the character of the people you see over there.

Now, I am going to tell you some things that perhaps will be interesting for you to know. I visited Ireland. I went into the country in perhaps one of the richest agricultural regions of Ireland. I went for the purpose of getting acquainted with them. Men keep bar-rooms and the women and children go there the same as men, and I am sorry to say that the women get just as boozy as the men, and if I never was a prohibitionist before, I certainly was when I left Ireland. I talked to these people. They found out I was from America; they are interested in America. They know all about the policy of our President. Strange to say, they knew nothing about our great Southland. Canada is America to them over there. I questioned them to find if they did not know somebody in these great cities in our South, and I found they did not. I merely mention this to remind you that we of the South are overlooking the best immigrants of the land, and the best of them are from Ireland.

I went from Ireland to Scotland. That's a pretty good country, but a Scotch farmer can make a living where an ordinary man would starve to death. They can live on a piece of ground that a flea could live on.

I went back to London, and the weather was so cold I thought I would go somewhere that I could get warm. I went to France, and it was so warm there that it made me feel like I was back at home. I was there some six weeks. I noticed the workmen on the streets. They were well dressed and prosperous looking. I went through their markets, and I noticed the women always doing something. When they did not have a customer they were sitting around knitting, or doing some kind of fancy work. I noticed in going with my wife to have some dresses fitted that the girls would show the dress and then she would sit down and take up a piece of fancy work of some kind. That is what makes France a great country—hard, steady work.

No further business coming up, the meeting then adjourned until 7:30 P. M.

NIGHT SESSION.

The first night session of the institute was interesting and instructive, and the attendance was splendid.

DISEASES OF FARM ANIMALS.

The first number on the program was a stereopticon lecture by Dr. George R. White, State Veterinarian, on "Diseases of Farm Animals." Before taking up his regular lecture for the night, Dr. White concluded his lecture of the afternoon on hog cholera serums. He told the farmers how the State of Tennessee had provided for the

fight against cholera by establishing a manufactory of serum on Clinton Street in this city that stood ready to send the serum to any farmer in the State. The speaker then showed several views of the plant, and of the processes used to make the vaccine.

Proceeding to his lecture on the diseases of farm animals, Dr. White showed lantern slides depicting various phases of glanders, bovine tuberculosis, black-leg in cattle and sheep scab. The lecture was made far more forceful and impressive by the lantern slides, placing before the farmers the actual causes of the troubles discussed.

ERADICATION OF THE TEXAS FEVER TICK, AND THE DEVELOPMENT OF THE CATTLE RAISING INDUSTRY IN THE SOUTH.

The concluding number on the night program was a stereopticon lecture by Dr. J. A. Kiernan, of the United States Bureau of Animal Industry, Nashville, on "The Eradication of the Texas Fever Tick, and the Development of the Cattle Raising Industry in the South."

At the opening of his lecture Dr. Kiernan flashed on the screen twenty stationary pictures of cattle affected with the tick, and the methods used to eradicate it. He followed this with two motion picture reels. The first showed the methods of dipping cattle to free them of the tick, also specimens of cattle in counties in the South where the tick had been destroyed. The second reel, over 3,000 feet long and declared by the farmers to be the best thing they had ever seen illustrating fine cattle, showed some of the blue-blooded stock of the cattle farms of Tennessee. Notable among these was the Lespedeza Farm, at Hickory Valley, in Hardeman County. Pictures of some magnificent shorthorns raised on this farm showed what could be done in Tennessee if the farmers would make persistent enough effort.

Dr. Kiernan's address in full follows:



The eradication of the cattle tick has won favor not only with the cattle men in Tennessee and the farmers of the Southeastern States, but it has assumed a national business importance, and has attracted the attention of the banker, the merchant, and the cotton seed associations; for in it they see the future development of the Southern States along profitable agricultural lines.

The Southeastern and Gulf States are not, in a true sense of the word, producers of cattle. There is a good and sufficient reason why they are not. The tick is the cattle man's Nemesis, and the Texas fever is the conqueror of his

ambition.

It was sometime after it was discovered that the tick transmitted fever, that the life history of the tick became known and an effort made to eradicate it. Texas was dipping cattle to destroy the tick long before any State east attempted any work along that line.

It was not until 1901 that a single farm was freed of ticks by eradication method, and that was accomplished with the crude petroleum applied with the dirty grease rag.

The concrete fact established that the parasite was eradicated from one farm gave encouragement to the people engaged in live stock sanitary work. An effort was then directed toward increasing the size of the area to be freed. However, it was not until 1904-5 that a single county was cleaned up. That was in North Carolina, and the simple method employed was taking the cattle out of the tick-infested pastures, cleaning them, and placing them in new pastures that had been kept free of stock the previous year. In one season the old ticky pastures become clean, by the starving of the ticks, then the owners can use all the pastures with impunity. That county was in the mountains and naturally contained an immense amount of rough country, not suitable for cultivation, which made it easy to use as pastures. When this method was tried in the Piedmont section of that State, and in other neighboring States, the farmers valued their cultivating fields too much to devote them to the growing of cattle. True, a short sighted policy—absolutely at variance with successful farming—for nowhere in this broad universe has farming been a success where only one crop is maintained.

It has taken years of constant work on the part of the efficient agricultural departments and farm institute workers to convince the people that farming can be made more profitable by employing cattle as part of the system, to feed part of the crop, and market it on the hoof, thereby gaining at least the market prices for the feed, and from 75 to 90 per cent of the market value of that feeding stuff retained in the form of fertilizer. It is a great consolation, however, to see that their work has not been in vain, for in all that section there is today a general demand for cattle, for pure-bred bulls, for grade heifers, for stocker cattle and for profitable cows. The eyes of these people are turned towards Tennessee—the first State to eradicate the tick. These people are consoled with the thought that in Tennessee lies the jewel of their rehabilitation; that on every hill, in every valley, and on the plains of your State are grown abundantly beautiful Shorthorns, rustling Herefords, prize-winning Angus, profitable Devons, and dual-purpose Red Polls.

The ambition of these people to get right agriculturally is the inspiration that keeps up the incessant cry, "Eradicate the tick." For tick eradication means the demand for cattle and better farming. In it people see, in the near future, the development of their farms on an equality with other sections of the country; they see the passing of the five- and ten-dollar per acre land; they see the bringing in of the desirable immigrant who is willing to pay the value that that land is entitled to be sold for. Then will the skilled and prosperous farmer

of the Middle West pack up his effects and ship them to the South, because that class of farmer who has made his pile in cattle raising is no longer debarred from the South by the cattle tick and the quarantine regulations.

This condition I have attempted to describe is not a fancy, but is borne out in every instance by actual conditions that now obtain, as you will glean from the following statements made by the leading officials of each of the counties:

"DEAR SIR: The work of tick eradication was finished in this county last year. I do not think that during my tenure of office, covering ten years, I have done anything that has been more generally approved by and was of more material benefit to the people of this county. Practically all of our farmers raise more or less cattle and much cattle are shipped out now from this county each year, and by virtue of being a free territory the farmers realize from \$6 to \$10 a head above what they did when we were under quarantine.

"Yours very truly,

"FRANK L. LYNCH,

"Franklin County Judge, Winchester, Tennessee."

"DEAR SIR: Farming and cattle raising are the chief industries of Marion County and in the eradication of the cattle tick the citizens have been greatly benefited. In fact this action on the part of the government has done more to increase the profits of the farmers and encourage the raising of blooded cattle than any one occurrence in the history of the county.

"Since this county has been placed above the quarantine line there has been a marked increase in the cattle business, and that is the avocation this section is especially adapted for. Just the fact that cattle are raised and fattened above the quarantine line makes a perceptible difference in the price per pound in the Northern and Eastern markets.

"This stroke of progress on the part of the government not only caused hundreds of farmers of this county to invest in blooded cattle, but along with this advancement came improved farming methods. It is natural that when man gets one thing of the best he then strives to bring all his interests up to that standard. This is being done in this county and we are now farming more intelligently and getting better results.

"The eradication of the cattle tick is a great thing for Marion County, and all the citizens highly appreciate this commendable work of our beneficent government. Very truly yours,

"CHAS. T. WILLIAMSON,

Marion County Judge, Jasper, Tenn."

"DEAR SIR: I am in receipt of your favor of the 18th instant relative to our county being benefited by eradicating the cattle tick. I must say that we are very grateful indeed for what the government did for us in the way of eradicating the tick, and can't find words in which to express the appreciation of the good people of our grand little county.

"I hope that every State in the Union will be free from the tick as we are. I remain, assuring you that it gives me great pleasure to contribute anything that would be of any benefit to the bureau in eradicating the tick,

Yours very truly,

"W. R. BURTON,

*"Chairman Moore County Court,
"Lynchburg, Tenn."*

From more than fifty-one counties in Tennessee that were free of ticks similar statements were received, and in the other States similar conditions exist. Don't labor under the impression that tick eradication was accomplished in these States without much difficulty. I doubt that if in all the annals of live stock sanitary control work there ever was a harder campaign, where so much disappointment, remorse and dejection was encountered. There never was a campaign in which so much opposition was encountered; organized opposition, threatening opposition, fighting opposition. In some places, work was entered into in the face of the opposition of 90 per cent of the people. Progress was naturally slow, but by constant perserverance, determined plodding, driving energy, and with the knowledge that the work was surely right, opposition was gradually overcome, and finally the unanimous good will of the people was obtained. The people obtained everything that was promised to them. They are obtaining it today—prosperity and satisfaction, and revived interest in farming, because they are making bigger yields, raising more cattle and better cattle, and getting better prices the year round. The lands are worth more and they are paying more taxes; they have better schools, churches and homes, and the young folks stay on the farm because there is something to attract and interest them. These are the things they were promised.

The story of the grease rag in killing ticks leaves only a mucky feeling. To splash in oil all day, applying it on horns and hoofs and the backs of cattle and even to their very eyes to reach the ticks, is a work better to have behind you than in anticipation. The evolution of tick eradication, like the improvement in every industry or profession, came gradually by the working out of practical ideas. For a time the spray pump was used to disinfect cattle. It was an improvement over the hand application but not absolutely satisfactory. The modern, practical, twentieth century method is the dipping vat, and since our people have begun to use it our work has progressed almost without any serious difficulties. There is scarcely any opposition and there is a far greater demand today for tick eradication than we are able to furnish cooperation for.

In our territory we have over 3,000 dipping vats, all built in less than three years, not constructed by the government or the State, but by the people. The counties in which these vats are located furnish the people with the necessary cement and buy the arsenic and soda with which to make the solution. The people furnish the gravel, sand,

lumber and labor. In actual outlay of money, the expenses are not more than \$20 for each vat. This includes the medicine.

Just a few weeks ago I attended a meeting of the county commissioners in one of the States; that body wanted to appropriate money to build the dipping vats for the people, and I wouldn't agree to work under that condition. I said: "If you will furnish the cement and medicine, we will cooperate with you; but we will not agree for the spending of a large amount of money by the county in constructing vats, which the people will not appreciate. If your board will furnish the people with the cement, we will organize them by communities and put in the vats with their labor. They will own them in cooperation with the county, and will take a pride in them, use them, keep them up, and bring all their cattle to be dipped regularly every two weeks all season. They will further see that their neighbors bring their cattle, and tick eradication will be a success in your county. Your people are industrious and naturally inclined to raise cattle if you will give them a fair opportunity to help themselves." We are now building vats in that county. At the county seat, when our inspector went there to arrange for the construction of the vats, the people were anxious to locate a site for a vat in the most convenient place. It was staked out, but, when he called for volunteers to dig the hole and mix the concrete, there were demurrers, and he didn't work there that week but went to the country where the people were not so fastidious about rolling up their sleeves and doing a little honest labor. When he returned to that aspiring city he was met by a number of people who said that they had clubbed together and were ready to furnish the labor.

As we go through this work from county to county we naturally learn a few things. We have picked up these facts, that people are willing to let well enough alone. If improvements are to be made, some organization must be perfected to lead the campaign for the people, or it is everybody's business and is nobody's business. Some person or organization must stand for progress and must wage an active campaign to get anything.

We would go on raising ticks, raising scrub cattle, raising one crop—tobacco, cotton—for years to come, if the States didn't organize to push the tick southward, to dump it off into the Gulf, to exile it from the land of an enlightened people. Our people believe that a person who has ticks on his cattle is more of a disgrace than an object of pity. We look at it a good deal as we care for our children. We would be outraged and humiliated to know they were affected with pediculosis. Years ago it was common, and every family possessed a generous-sized bottle of hair oil. Our people won't drink milk from a tick-infested cow now and in a few years it will be a misdemeanor to have ticks on one's premises. Some people still argue that the world is not round, and a good many try to crown Bacon with Shakespeare's wreaths of glory. Some think the telephone, wireless telegraphy and heavier-than-air machines are simply things that were bound to be, were predestined, rather than believing them works of the world's geniuses.

Having these particular achievements in mind, I am not surprised when some people doubt that the tick can be eradicated.

The child goes to school and learns spelling, reading and arithmetic. It learns the multiplication table, and the source and mouth of the Mississippi River, together with many other things; and, after learning that 2 and 2 make 4, it is so positive that these two numbers always make the same total that there is never a moment of doubt about it.

Now, since 1906, 200,000 square miles have been freed of ticks and released from quarantine by the federal government. That means many, many thousand farms have been freed of ticks; small farms, large farms and ranches, stock law counties and free range counties, counties containing but a few cattle and counties containing many cattle; in areas touching the northern limit, where the tick will not survive the winter, and counties almost touching the Gulf, where ticks live the year round; counties in the East and counties in the West; along the Atlantic, along the Pacific; dry counties, and counties where the average rainfall is fifty inches per annum; from bluegrass fields, Bermuda pastures, Lespedeza ranches and broomsage ranges; river bottoms and highland pastures; upon plain and delta bottoms—ticks have been driven from such areas and will not return unless brought in by cattle or Texas ponies. Knowing these things, having done this work year after year, there is no question, there is no doubt, there is no hesitancy in saying that ticks can be eradicated; the tick must be eradicated; the tick will be eradicated within the next ten years.

Tennessee started tick eradication in 1906. There were in quarantine at that time fifty-seven counties, and in Kentucky three counties. That year Congress appropriated funds to cooperate with the States in tick eradication work. It was late in the summer when the forces were organized, consequently not very much was accomplished that year.

In 1907 the work was put in operation in several counties in the Volunteer State, the Bureau of Animal Industry contributing a greater part of the funds to employ inspectors. Each year from that time the bureau has been spending a little less money and the counties contributing more.

In 1908 the bureau spent in Tennessee \$30,000, but in 1912 the bureau only spent \$11,000. However, the counties and State of Tennessee spent \$21,783. In 1912 there were inspected in the State of Tennessee 92,000 herds with a total of 500,000 cattle. Today Tennessee has only part of one county in quarantine. Mark you! in 1906, fifty-seven quarantined counties; in 1913, only a small portion of one county. Tennessee rejoices in this great achievement, and has laid down an order that it shall continue to keep free of ticks.

Tennessee is the first State in the Union to completely stamp out the ticks.

Is Tennessee going to rest on its laurels? No, indeed. Tennesseans have paid their hard-earned money to have opened up to them the world's markets for their cattle. They value that privilege too

highly to lay down the bars. Let us see what Tennessee is doing to keep free of ticks.

The United States Government, by an Act of Congress, permits the shipment of diseased cattle from the infected area to certain market points for immediate slaughter. Tennessee does not. The cities of Memphis, Nashville and Chattanooga formerly maintained pens for quarantined cattle. They are being used now for hogs. Tennesseans are going to eat tick-free beef in the future.

Now the Commissioner of Agriculture and the State Veterinarian in Tennessee are extremely enlightened men, both raised on farms. They command the respect of the good people of their State. But they are progressive from the word go. They no longer look upon the tick as a necessity, but rather a disgrace. Mind you, they don't attempt to discriminate against cattle from Alabama, Georgia or Mississippi, providing the cattle are equivalent to Tennessee-raised cattle. The butchers and the cattle dealers can go to the free area or counties of Mississippi, Alabama and Georgia and ship cattle to Tennessee for any purpose at any time of the year. They can go into the counties in those States in which tick eradication is being conducted and ship, under supervision, cattle which have been dipped into any part of Tennessee at any time of the year for any purpose. But they do prohibit the movement of cattle from counties in those States or counties not engaged in the work of tick eradication for any purpose at all. They cannot come even for immediate slaughter, and this is not merely a paper regulation, but a real live, active one. Tennessee put it up to the railroad companies not to bring cattle in from the tick-infested area, and the railroads are cooperating, because they see in the work the future development of the country along their respective lines.

Other States may be satisfied with the quarantine markets, but we are not. We are going to get free cattle to the free markets of the world; we are going to get that diseased cattle card taken from our cars; we are going to stop the stamping of waybills covering our cattle shipments as "Southern cattle"; we are going to keep out the diseased cattle pens; we are free American citizens, and the best markets are none too good for us. The tick has pauperized us, and we are through with it. We are for progress, prosperity, cleanliness, and all the other attributes of good living.

I think we have worked in counties in Tennessee under the most adverse circumstances that could obtain anywhere. We have been in the free range counties over which cattle run indiscriminately the year round. These counties have ranges covered with a thick, scrubby underbrush, counties sparsely settled, pastures very much in the minority, and yet the work done in these counties last year was the best work ever done in Tennessee. There is a reason for such cooperation. I will call to your attention the conditions that existed in one county for several years.

Nearly every time the county court held a meeting some of us would be there to see if the work would be taken up. We were always treated courteously, and introduced for a talk, but there was "nothing

doing" but talking. That county refused to spend a nickel, and then something happened. The same Commissioner of Agriculture and State Veterinarian issued an order to the railroad companies to securely lock their stock pens and refuse the shipment of cattle for any purpose without a permit from a State live stock inspector. Petitions and commissions and delegations rolled into the Capitol; and enraged people, deprived of their constitutional rights, demanded of the Governor and other State officials modification of that order, amendments, special privilege on the usual grounds—a dry year, lack of grass, a wet year, washy grasses, and the other year's lack of time to get ready for the regulations. The Governor told the petitioners that he had implicit confidence in the Agricultural Department, and referred them to it.

The strongest opposition to tick work in that county was his honor, the Judge. He was elected on an anti-tick platform for a period of six years. Unable to ship their cattle out, the people organized to get relief. They applied to the County Court. I attended that session and after listening to arguments for three hours, that honorable body decided by a vote of 23 to 15 not to do anything. After adjournment the people buttonholed their representatives, demanded relief, and the court was reconvened and unanimously agreed to get to work. In less than sixty days fifty dipping vats were constructed. All the cattle were dipped regularly every two weeks and permits were issued for each herd to run on the range. At each dipping the owner brought his cattle and permit, and after the cattle were disinfected the permit was renewed for two weeks longer. The county employed ten inspectors regularly, and that county is now in the free area. I visit that section quite often, and if there is an opponent to the work in that county I haven't found or heard of him in several months. The Judge who opposed the work so long has been legislated out of office by an act of the Legislature abolishing the office of County Judge and substituting a Chairman of the County Court.

This work of tick eradication is too big for any individual, any official or any organization to oppose. It is a roadroller gathering impetus every day. Now, the other counties of Tennessee did a similar class of work, and they all are now in the free area, and are glad the Commissioner of Agriculture and State Veterinarian forced them to do it—eradicate the tick. They know they are their friends. They know that these men had the backbone to put something on the people that they thought they didn't want because of lack of a thorough understanding.

As well as Tennessee has done, Mississippi is doing better. We tried for several years to induce the northern counties of Mississippi to take up the work, but the officials refused to appropriate a nickel. Finding such conditions, inquiry was made in the southern counties of Mississippi, which had been invaded by the boll weevil, and a ready response was their reply. Stricken by an unconquerable foe, reduced almost without warning from a reign of opulence to one of panic and chaos, the annual production of cotton was reduced in some of the boll

weevil counties of Mississippi more than 90 per cent. The abandonment of the plantations by the renters left the owners in a helpless condition, but, like true Anglo-Saxons, they buckled on their armor to fight and die rather than surrender.

"Cowards die many times before their deaths;
The valiant never tastes of death but once;
It seems most strange that men should fear,
Seeing that death, a necessary end,
Will come when it will come."

Naturally the treasuries of counties so afflicted would be somewhat depleted, but in one way or another pretty nearly every county in the western part of Mississippi has arranged to employ from five to fifteen inspectors for tick eradication work for the length of time necessary to complete that work. A number of these counties have succeeded in eradicating the tick in one season's work.

On March 1, 1911, the Board of Supervisors of Holmes County officially adopted the regulations of the Mississippi Live Stock Sanitary Board and appropriated funds for the construction of dipping vats, the purchase of ingredients for making arsenical solution, and the employment of inspectors. In a very short time 150 dipping vats were in operation and all the cattle in more than three-fifths of the county were dipped regularly every two weeks, but the balance of the county, which is located in the delta, was overflowed until too late in the season to construct the vats. All the area in which active work was done was freed of ticks that same season and the following spring released from quarantine.

This demonstration was the means of the Supervisors of Yazoo, Washington, Issaquena, Attala, Leake, Madison, Hinds, Rankin and other counties taking up the work in 1912. and in most of these counties the ticks were exterminated and most of them released from quarantine this spring. In consequence of their success, a new group, a larger group, of counties have already begun the campaign this season. The spirit has become contagious, until now it pervades the entire State.

We are now working in counties in which there exists 100 per cent of infection among the herds. We find less opposition in these new counties than was encountered six years ago in counties where perhaps only 10 per cent of the herds were quarantined.

In 1909, that is when active work was started in Mississippi, the State and counties spent a total of \$3,500 and the bureau spent \$10,400, nearly three dollars for every dollar the State and counties spent. In 1912 the bureau spent \$41,000 and the State and counties spent \$86,000, reverse of what it was three years previous, the State and counties spending more than two dollars for every dollar spent by the government.

In all, Mississippi has taken up the work in about fifty-five counties. There are twenty-two counties in that State that are free of ticks and released from quarantine—three years' work. This year ten or fifteen more counties will be free—five years from now the entire State.

It is a grand privilege to work with such people. We know their plans, ideas and purposes, and they know us. We are one great family, working in harmony. Their laws and regulations are all that law signifies; they are observed. A man writes in to the Sanitary Board for a permit to move cattle. He says he made application to the inspector, but he wouldn't grant it. The Sanitary Board replies: "It is a matter of much regret that we cannot comply with your request. This office is not given any more privilege than the inspector located in your county. Put your shoulder to the wheel and help with the work and we will relieve you and every other man in the county of quarantine regulations."

Now, Mississippi owns some cattle. Last year they dipped 202,000 herds, representing 2,100,000 cattle, but they had 2,500 dipping vats to dip them in. One county had 133 dipping vats, and dipped regularly every two weeks 32,000 cattle. And the United States Census for 1910 shows that the county only had 29,000 cattle. You can see they were dipping all the cattle every two weeks. A word about how the work was started in that county.

The Commissioner of Agriculture and the writer went before the County Board of Supervisors. We were told before the meeting that three Commissioners were opposed to the work and two in favor of it. Some confidentially advised said: "Do not go near them this month." But we went there for that purpose, and we saw them and put it in this way: "If the County Supervisors will agree to furnish material for the number of vats that the people call for, the regulations need not be adopted until the Supervisors ask for them." The work was started in June, 1911; in 1912 133 dipping vats were in operation, and this year the county is released from quarantine.

From the day the work was first started until the present day there has never been a single day of idleness. Every week cattle are being shipped from that county to the free markets—the National Stock Yards and elsewhere. The only complaint in the county is the butcher, who has trouble finding any two-cent cattle. He says we have deprived him of his market, and in doing so the farmer is getting five to ten dollars more per head for his cattle. That is the only kind of injury we want to do. Help the producer get more money for his labor.

Last year we had an active contest in tick eradication in Mississippi. Seven counties entered into the contest and the prizes were fourteen pure-bred bull calves, seven dairy type and seven beef type. All season the people of these counties waged a hot fight to see which would have the fewest number of ticky herds at the end of the year. A total number of 134,384 cattle were dipped in these seven counties every two weeks, but there were 1,667 dipping vats in which to do it. A committee, consisting of Dr. Tait Butler, editor of the *Progressive Farmer*; Commissioner Blakeslee, and Prof. Smith, were asked to decide which county or counties were entitled to the prizes; but the work was so uniform and such little difference in them that they awarded each of the seven counties two bulls.

Now, one of the stipulations in the contest was that no county was eligible unless it had a live stock association. These live stock associations, of which about sixteen were organized last year in that State, are really active. They are raising money to purchase pure-bred bulls, and many of them have already brought in shipments of bulls. The remarkable thing about these associations is that they are no longer looking for the \$50 bull, but pay \$200 to \$300 for bull calves. One association bought at one time three bulls and twenty-three heifers from one Shorthorn herd in Tennessee. At one point, Canton, Mississippi, about six months ago, the Madison County Live Stock Association shipped in a carload of Shorthorn cattle from Kentucky. Now these cattle go only to tick-free premises. You all know that hundreds of cattle, pure-bred stuff, have been shipped into the quarantined area for years and years, only to be consumed by the tick. But now in these counties they are going to tick-free places. Madison County is making a specialty on Shorthorns, and they are going to stick to Shorthorns, and it will not be long before that will be a community with a reputation of breeding Shorthorn cattle. Cooperation is the keynote of their enterprise which will be rewarded with success. Cooperation is the keynote of tick eradication work.

I don't know where the State or the government is going to get the men to furnish cooperation to the counties that are demanding it this year. I am not figuring that end of it. I am keeping pace with the demand and helping to make the demand for the work, because I am hired to do tick eradication work. It is my business, and I am going to push it as far as I have the energy and ability to do so. When the people signify their cooperation by spending \$121,000 of their money to kill the tick the States or the government can't refuse to aid them.

In 1909 the government spent \$62,000 in our territory and the States and the counties spent \$29,000. In 1912 the government spent a similar amount of money, but the people spent almost five times as much as they spent in 1909.

In Mississippi, the people are in for making seventy-five million dollars out of tick eradication, and I will tell you how: In 1910 the census of the United States shows Mississippi had 1,120,632 head of cattle, valued at \$15,269,364, an average value of \$15 per head. A few years after tick eradication is completed they are going to have 2,967,160 cattle, valued at \$89,014,800. They are going to have less cattle than Illinois has now per square mile, but in place of \$15 being the average value, they are going to have the average value of Illinois cattle, which is \$30 per head, and perhaps they are going to have more cattle and better cattle than Illinois. They are going to grow up with this new industry, and the associations are going to keep them guided right. Illinois cattle are deteriorating because the people think their land is too high priced for cattle. We are going to build up and up and up until none of them can beat us. We have done a little of this building up already.

In Hardeman County, Tennessee, at Hickory Valley, a man by the

name of Duryea owned a 16,000-acre hunting preserve for several years. He is a very rich man and could afford to have this plaything to entertain himself and friends. But he decided one day after visiting the Elmendorf Stock Farm in Kentucky that, if it were possible, he would convert his hunting preserve into a live stock farm. Now, gentlemen, if there is any section of the entire quarantined territory that, on the face of things, presented less encouragement for live stock raising than that plantation, I have yet to look it over. This place was formerly a number of cotton patches that had been worked for more than fifty years. Broomsage and underbrush covered the entire place. Shaded and poisoned by roots of trees and shrubs, scarcely any grass grew. The former manager had anywhere from 500 to 1,000 cattle roaming all over the place. It was a pitiful outfit to gaze upon; veritable scrubs, ticky scrubs, sought for by no one, a constant source of annoyance, without profitable compensation. To shorten the story, the place was fenced, stock taken off one-half and dipping vats built at several points. Dipping was continued one season and at the end of that year 100 head of Shorthorns were brought in from all sections of the United States, Canada, Scotland and England. The underbrush was cut off and burned, plowed up and planted to Japan clover. Last year two tons of Lespedeza hay was made off each acre cut. Now there are 300 registered Shorthorns on that farm and several hundred cows, six silos, which were entirely filled with corn and sorghum ensilage last fall. The entire herd was fed on feed raised on the Lespedeza farm.

At the fairs in our section last year this herd received almost every first prize, even in competition with herds from Illinois and Ohio. The manager told me a few days ago that he didn't have a young animal on the place for sale, that they had all been sold and shipped into counties that had been freed of ticks or in which tick eradication is being conducted. Gentlemen, I say to you that this is a demonstration farm of national benefit. It demonstrates that cattle did not die from acclimation fever when brought into the Southern country; they didn't die from bloody murrain. It demonstrates that in the area freed from ticks the cattle industry can be developed to the very highest degree; that abundant crops may be raised in all our tick-infested area. In some sections, perhaps, grasses may not grow abundantly, but where that is so, sufficient can be grown to make summer pasturage and winter feeds can and should be produced anyway. Here cattle are bred and reared and fattened and marketed from what was formerly a disgraced tick-infested area that didn't raise a respectable load of cattle in the whole 800 square miles of the county. This demonstration is an inspiration and one that inspires us to keep on killing ticks and spreading the campaign for more or better cattle.

Let our efforts be lifted to that plane of endeavor that will hasten the day when tick-diseased cattle no longer are raised in our beloved nation. We cannot successfully raise cattle and raise ticks. You can fight to keep down the ticks, but the annual losses will sap the profit out of the investment. Tick eradication is reduced to a practical basis,

and those who dip their cattle conscientiously will get rid of ticks. An individual can do it, a community can do it, and a county can do it. Mississippi can do it, and Tennessee *has* done it.

SECOND DAY—WEDNESDAY, OCTOBER 22, 1913.

MORNING SESSION.

The convention was called to order by President Robert Gallagher. The invocation was offered by Rev. T. A. Patton, a Presbyterian minister of Petersburg, Tenn.

President Robert Gallagher then introduced Prof. H. A. Morgan, Director State Experiment Station, who made an interesting address on "Rotation of Crops." Professor Morgan's address follows:

CROP ROTATIONS.

MR. CHAIRMAN, LADIES AND GENTLEMEN:

Farmers of this State have not acknowledged by practice the influence of crop rotation upon better methods of farm management, embracing, as it does, economical soil improvement and live stock husbandry.

I do not believe we are going to become in earnest about rotations, and rural uplift in general, until we have experienced definite convictions based upon practical and scientific reasons. When we experience such convictions our practice of rotation will be the rule, and not the accidental exception as now commonly obtains.

Tennessee has too large an acreage in corn—over 50 per cent of the State's entire crop area is devoted to corn. We can use most satisfactorily a greater quantity of corn than we now raise, but it is possible to realize a larger total yield on fewer acres under judicious systems of rotation and better farm management.

Corn, under the system now practiced, prevents the best farm practice in rotation. It discourages winter covers and for the most part the growing of many legumes long since proven well adapted to our conditions and a more profitable type of agricultural practice.

We must seek substitutes for corn that will occupy the ground at other seasons of the year and thus permit of a greater elasticity in crop rotation, and give opportunity for the preparation of the ground and seeding of other crops at a time when the best practice indicates that they should be sown. On better lands, winter barley is an admirable substitute for corn—pound for pound, it is better than corn for farm feeding purposes. The drought of the past season teaches the lesson of more barley. I know of farmers who had made 40 bushels of barley per acre before the drought became serious. The same may be said of better strains of winter oats planted in September. By using barley and winter oats, the growing season, between

the time of harvesting and the planting of summer crops is utilized. In Tennessee this amounts to 12 per cent of the year's growing activities. A drought, or other of nature's methods of chastisement, is often necessary to call attention to errors of long practice. The farmer does not always seek the advice of nature. Solomon said, in substance, many hundred years ago: "Go to nature, consider her ways and be wise." He surely meant this in connection with crop rotation. Nature rotates forest and field crops and while we have noticed this we have not realized the message was one for us.

The conditions which prevailed in Tennessee and for the most part throughout the South suggest crop rotation as a judicious and economical practice are the following:

1. Growing weather obtains between the time of harvesting and the planting of summer grown crops. The winter season in the South is a growing season for many plants.

2. Crops which may be successfully grown and economically used are both shallow and deep-rooted. When alternated as in a rotation, the plant food supply is taken, to a more or less degree, from different depths of soil. In other words the feeding area of farm crops may be greatly increased by alternating deep and shallow-rooted crops in the same field.

3. Farm plants do not all make the same demand upon a soil, nor in the same way. Rotation gives opportunity during the growth of one crop for the activities of nature to make plant food available for another. Nature revolts when a succession of the same crop is practiced by producing conditions which we term "crop sick."

4. Most farm crops draw heaviest upon the element nitrogen. This is the one that taxes the farmer most when he has to supply commercial plant food, costing from three to six times as much as phosphorus or potash. With the limited supply of commercial nitrogen and at present prices famine would prevail in time were it not for the fact that legumes in cooperation with microscopic plants get nitrogen from the air in quantities many times in excess of that supplied in profitable amounts of commercial materials. It seems, therefore, reasonable and wise, to alternate a non-legume which depends upon the soil alone for its supply of nitrogen with a legume which takes its nitrogen from the inexhaustible supply in the air. At present, soil improvement is more dependent upon our making provisions for legumes in farm rotations than upon anything else.

Just here it may not be out of place to emphasize the necessity of liming practically all Tennessee soils in order to again grow red clover successfully, and to encourage the production of even the more important nitrogen gatherer—alfalfa. Abundant experimental evidence is at hand to show that red clover may be restored to the State, and that alfalfa may be profitably produced on any of the soil areas of Tennessee.

5. Our greatest waste of soil is due to the nature of the climate.

Cultivated areas in warm climates lose heavily in organic matter. A rotation that provides crops of grass, clover, and grain covers, usually protects vegetable matter from being destroyed by heavy rains and hot sun and invariably gives more economical returns. We can easily adopt a rotation that will use our winter growing temperatures, avoid the awful consequences of washing rains, and protect the soil from loss of so much organic matter by reducing unnecessary tillage operations in summer time.

6. Weeds, insects and diseases of plants are heavy drafts upon the profits of our farms. Their presence is simply reminders of the necessity of better rotations. There are few weeds, insects, or plant diseases that are not controlled by properly adjusted rotation systems and up-to-date cultural practices. You have but to be reminded of methods of controlling the Hessian fly, the army worm, grasshoppers, clover disease and pests as taxing and as prevalent, to realize the necessity of better rotations for the protection of our interests against common weed, insect and plant disease pests.

7. Plants are grown for animal use. No one plant fulfills all requirements—balanced food, shelter and clothing. "Man cannot live by bread alone," nor can the horse, cow, and hog live on corn alone. With over 50 per cent of our cultivated land in corn, our animals are irrationally fed, unprofitably fed and poorly kept. We are not growing too much corn, but our lands are devoted to this crop to the exclusion of those designed by nature better suited to our conditions. We have sinned against the soil, the crop and the animal. Our punishment consists of wasted soils, low production, burdensome pests, high-priced feeds, poorly fed animals, restricted and congested markets, an increasing tenancy in practically every county, and worse than all else, the turning of the best manhood from the farm.

The wider the range of annual production on the farms of Tennessee, the greater will be the market activity for farm crops. If hay be raised for the local market, the farmer has but a single outlet for his crop, but if he feeds this to cattle, he produces a market for his hay in beef, milk, cream, butter, cheese—thus creating six avenues of sale instead of one. There is less possibility of six markets becoming congested or cornered than one. In the case of a grain crop, bacon, lard and poultry may be added to the six cow markets. To these may be added mutton, wool, mules and horses. It is plain that one function of animals on the farm is to create market activity and multiply the outlet for farm crops. Rotations should encourage live stock for after all the soil, the crop, and the animal are usefully associated on the farm—soils feed crops, crops feed animals, and animals feed soils.

Recognizing the above as an enumeration of the fundamentals in a rotation of crops, I shall now outline a few systems of rotation that may be considered applicable to Middle Tennessee conditions:

4. THREE-YEAR ROTATION.

	Field 1.	Field 2.	Field 3.
First Year	Winter Grain (wheat, oats, or barley); crimson clover sowed in August.	Crimson clover under for Corn. Rye and crimson clover sowed in corn last cultivation.	Rye and clover under and land planted to Soy Beans for hay, and ground sowed to winter grain.
Second Year	Crimson clover turned under and land planted to Corn. Rye and crimson clover sowed in corn at last cultivation.	Rye and clover under and land planted to Soy Beans for hay, and ground sowed to winter grain.	Winter Grain. Crimson clover in August.
Third Year	Rye and clover turned under and land planted to Soy Beans for hay.	Winter Grain. Crimson clover sowed in August.	Crimson clover turned under and land planted to Corn. Rye and crimson clover sowed in corn at last cultivation.

41. THREE-YEAR ROTATION.

	Field 1.	Field 2.	Field 3.
First Year	Winter Grain (wheat, barley, or oats). Grain stubble broken immediately after removal of crop with sub-soil plow and disc harrow and kept fallowed until last of August, then sowed to Red Clover without a nurse crop.	Red Clover. First crop cut for hay. Second crop turned under for green manure, and land sowed to rye and crimson clover in early September.	Corn.
Second Year	Red Clover. First crop removed for hay. Second crop turned under for green crop and land sowed to rye and crimson clover.	Corn.	Winter Grain (same as Field 1, first year).
Third Year	Corn.	Winter Grain (same as Field 1, first year).	Red Clover (same as Field 2, first year).

III. FOUR-YEAR ROTATION.

	Field 1.	Field 2.	Field 3.	Field 4.
First Year	Corn sowed to rye and crimson clover last cultivation.	Rye and crimson clover turned under for green manure, and ground planted to Soy Beans for hay.	Winter Grain (wheat, oats, or barley). Grain stubble broken immediately after crop is off, fallowed and sowed last week in August to red clover.	Red Clover. First crop for hay; second crop turned under for green manure and sowed to rye and crimson clover early in September.
Second Year	Rye and crimson clover turned under for Soy Beans for hay.	Winter Grain. After grain ground sowed to red clover in August (same as Field 3, first year).	Red Clover. First crop for hay; second crop turned under for green manure, and ground sowed to crimson clover and rye.	Crimson clover and rye turned under for Corn, seeded to rye and crimson clover last cultivation.
Third Year	Winter Grain. Ground sowed to red clover in August (same as Field 3, first year).	Red Clover (handled same way as Field 4, first year).	Rye and crimson clover turned under for Corn, seeded to crimson clover and rye last cultivation.	Crimson clover and rye turned under for Soy Beans for hay.
Fourth Year	Red Clover (handled same way as Field 4, first year).	Rye and crimson clover turned under for Corn, seeded to rye and crimson clover last cultivation.	Rye and crimson clover turned under for Soy Beans for hay.	Winter Grain. Ground sowed to red clover in August (same as Field 3, first year).

IV. FOUR-YEAR ROTATION.

	Field 1.	Field 2.	Field 3.	Field 4.
First Year	Wheat. Stubble broken with subsoil plow and disc harrow immediately after crop is removed. Ground fallowed until last week in August and sown to red clover.	Red Clover. First crop for hay; second turned under and land sowed to barley in September.	Winter Barley. Stubble broken same as Field 1, and sowed to crimson clover in August.	Crimson clover turned under for Corn .
Second Year	Red Clover. First crop for hay; second crop turned under and land sowed to barley in September.	Winter Barley. Stubble broken as in Field 3, first year, and sowed to crimson clover in August.	Crimson clover turned under for Corn .	Wheat. Sown to red clover (as Field 1, first year).
Third Year	Winter Barley. Broken and seeded to crimson clover (as Field 3, first year).	Crimson clover turned under for Corn .	Wheat. Sown to red clover (as Field 1, first year).	Red Clover. First crop for hay; second turned under and ground sowed to barley.
Fourth Year	Corn.	Wheat. Sown to red clover (as Field 1, first year).	Red Clover. First crop for hay; second turned under and ground sowed to barley.	Winter Barley. Broken and seeded to crimson clover (as Field 1, first year).

Rotation II may be extended into a four-year one by seeding grass with the clover and permitting the grass and clover to remain two years. The second year may be pastured or cut for hay.

Rotations III and IV may be extended into five-year rotations by seeding grass with the clover and allowing them to occupy the ground two seasons, either pasturing the second season or cutting for hay.

In rotations II, III, and IV, alfalfa may be sown with the red clover and grass. Where the lands are limed, inoculation may be expected and fair yields of alfalfa gotten with the clover and grass.

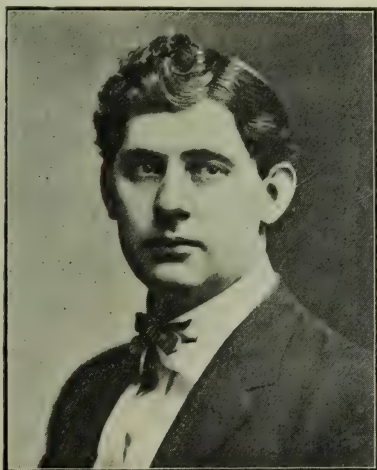
CORN CLUB COMMITTEE.

Professor J. R. Fewell—I just want to say one thing about the Boys' Corn Club. The Corn Club Committee will begin grading the corn and report just as soon as possible. The following are the committee:

Captain T. F. Peck, J. W. Brister, H. A. Morgan, H. D. Tate, L. M. Rhodes, J. R. Fewell, S. M. Warren, J. W. Russwurm, Verd Petersen, J. M. Dean, L. P. Bellah, Judge Robert Ewing, J. W. Tomlinson, and L. R. Neel.

FEED AND SEED LAWS OF TENNESSEE.

A. L. Garrison, Chief Feed, Seed and Fertilizer Inspector of the Department of Agriculture, was introduced and addressed the convention on 'The Feed and Seed Laws of Tennessee.' His address follows:



Now, gentlemen, if you will just give me your attention for a little while I will assure you that I will not bore you by taking a great deal of time. In taking the subject in this way and in this manner there is always an advantage and a disadvantage. It has been my good fortune to follow Professor Morgan more than fifty times in this State in the last three or four years, and never in my life on any of those occasions have I failed to have a wide-awake audience when I began speaking, because he always leaves them that way. Yet there is a disadvantage, because there is a feel-

ing that we have gotten the best. That is often true.

In beginning my subject I want to assure you that I will take just as little time as possible, because my time is now already up, but let me tell you it did afford me pleasure, and I believe that in doing so, in Professor Morgan taking my time, in allowing him to do so, that I played a part, that those in charge of the program played

a part, in the development of Tennessee, because in a talk like that Tennessee and Tennesseans are bound to be benefited. It has given me pleasure, as well as you, and I am sure that you will profit, and I know that I have profited by being enabled to hear this address. Especially was I pleased when he said, "If I were to be born again I would select Tennessee for my birthplace, and this because it is the best State in the Union." Gentlemen, I believe that. I believe it just as firmly as that I am standing before you, that it is the best State in the Union.

One of Tennessee's most honored citizens, who is now dead, in relating a little bit of his early history (and you will recognize him by the language he used), said in his first race for public office there was a joint debate arranged, and in that joint debate his opponent came first. After listening to him, his argument and discussion was so able and forceful that when his time came to address the audience he felt there was nothing for him to say; there was nothing left for him to do but acknowledge defeat and vote for his opponent, but in order to collect his thoughts he decided he would indulge in a bit of spread-eagle oratory, and he began by saying:

"My fellow citizens, my countrymen: It has long been my desire to represent this patriotic and God-fearing people in the most powerful, the most august law-making body of this great nation, this great nation that stretches from the frozen pines of Maine down to where the magnolias bloom, that stretches from the calm and placid waters of the Atlantic to the turbulent waters of the Pacific."

About that time a drunken man in the audience raised up and said: "By —, let her stretch." Now, you can excuse that expression, but when I listen to talks like I have heard today I want to say, "Let her develop." I do not want to say it in the spirit that man said it, but I want to have a little part in this development, and I believe in my work in the Department of Agriculture I have a little part. My duties are to enforce, as best I can, under the Commissioner of Agriculture, the agricultural laws, enacted for the benefit and protection of the farmers of Tennessee. Let me make this statement—that I do believe that it is possible and that it is absolutely necessary that there be regulation and control. I do not mean that there must be regulation and control only in the necessary commodities of life, but I do say to you that I believe that it is absolutely necessary, even in the absolutely necessary commodities of life. If there should in this week, or this month, or this year, be a proclamation issued by the Federal and State governments of this country that would read something like this—

"Know All Men By These Presents, Greeting: That there will not in the future be any restrictions, any ban whatever, placed upon the manufacture, sale and distribution of any necessary commodity of life"—

I believe that would sound the doom of the human race. I believe that is a fact. I believe that has been demonstrated by the trade of this country. If that were true, if they would go so far as to adulterate these absolutely necessary commodities of life, what would they

do in feed, seed and fertilizer? That's my work—looking out for adulteration in these three commodities.

These laws are of recent enactment. I could not think of taking them up section by section. I can merely call your attention to the fact that there have been put upon the statute books of Tennessee these three laws for your protection, and it is very largely up to you as to the measure of protection you receive. There may be in your mind this thought: "You hold that position, it is your duty, you are paid to give us this protection afforded by this statute." That is true to an extent, and I want to tell you here and now, and I defy anyone to deny it, that for the last three years I and three others in the Department of Agriculture have put in 365 days in each of these three years of this work. We have done the best we could.

I want to here and now stress just as forcibly as I can the absolute necessity for organization among the farmers of Tennessee. That is necessary if we get the best results from any law that is enacted. If the farmers of Tennessee would organize like the commercial travelers of Tennessee, with a voice that would be heard from North Carolina to Arkansas, from Kentucky to Alabama, would the Legislature hear a voice like that? Most assuredly they would. You could in your organization get together and discuss the weak points in these laws. You could figure out amendments that were needed, and then what would you do? You would let it be known to the Legislature when it was in regular session and demand the enactment, not only of that amendment, but of a new law. That would not be the only advantage of this organization. That organization would be looking out for violations of the law, and instead of some farmer notifying the Department of Agriculture that he believed that there was a violation of the seed law, or the feed law, there would come a voice from the organization in that county.

Now, gentlemen, I just want to read you the first section of the feed law. It will take just a minute or two. It is known as the Feed Control Act, Chapter 434, Acts 1909, reading as follows:

SECTION 1. *Be it enacted by the General Assembly of the State of Tennessee*, That every lot or parcel of concentrated commercial feeding stuff sold, offered, or exposed for sale within this State shall have affixed thereto, or printed thereon in a conspicuous place on the outside thereof, a legible and plainly printed statement, in the English language, clearly and truly certifying the weight of the package (provided that all concentrated commercial feeding stuffs shall be in standard weight bags or packages of 5, 10, 25, 50, 75, 100, 125, 175 or 200 pounds); the name, brand or trade-mark under which the article is sold; the name and address of the manufacturer, jobber or importer; the names of each and all ingredients of which the article is composed; a statement of the maximum percentage it contains of crude fiber, and the percentage of crude fat, and the percentage of crude protein, and the percentage of carbohydrates, allowing 1 per cent of nitrogen to equal $6\frac{1}{4}$ per cent of protein; all four constituents

to be determined by the methods in use at the time by the Association of Official Agricultural Chemists of the United States.

Now, as to the importance of that one little provision—the weight of the package—the people of this country have been cheated out of millions of dollars by that one little thing, short weight.

Let us see the next point—"Clearly and truly certifying the weight of the package, the name of the feed stuff, the brand, the trade-mark under which the article is sold; the name and address of the manufacturer, jobber or importer; the name of the ingredients of which the article is composed. . . ." We want you to tell us what this mixed or concentrated feed stuff is composed of? What have you back of that molasses with which you have sweetened this feed? Tell us what it is? That is important, gentlemen. Then you must give us the composition of this feed stuff; that is, give us the pure protein, fat, fiber and carbohydrates which represent the money value of the feed.

As I said, the importance of this law is in keeping down adulterations. Corncob meal will cost \$4.00 a ton to manufacture; wheat bran will cost \$20.00 a ton to manufacture; a half ton corncob meal \$2.00; a half ton wheat bran \$10.00. The two mixed together, half and half, would cost \$12.00 a ton, sold to you as pure wheat bran at \$24.00 a ton, sold to you at a profit of 100 per cent, or \$12.00 on a ton. You might not notice the difference. One is red corncob meal and the other is wheat bran; they are mixed 50 per cent each and sold as pure wheat bran.

Now, that is the unscrupulous manufacturer and jobber. He is the man we are after. Listen: One man manufactures pure wheat bran at \$20.00 a ton—products worth the money—puts it up to you at \$22.00, a profit of \$2.00; that is legitimate. The unscrupulous man says, 'I am making \$12.00 a ton on this. I will cut from \$24.00 down to \$22.00, and I will sell at the same price of my honest competitor.' People have confidence in the one man and they give him the trade. The unscrupulous man sees this and says, "I will cut it down to \$20.00," and there is where he gets it. They leave the honest manufacturer and buy the adulterated product. The result is they put the honest man out of business, because he cannot manufacture and sell an honest product at a low cost of production. Maybe he does not go out of business; maybe he goes with his dishonest competitor, and they put it up to \$28.00. Who suffers?

That, gentlemen, is the necessity of the enactment of a Feed Control Law. That amounts to about \$4,500,000 in Tennessee every year. That might not only be true with cob meal, but that is true in field seeds. That same question bobs up again—that same monster, adulteration. You wonder how we could be swindled in the purchase of field seed. I will just make one illustration: This seed law demands of the importers and dealers of field seed to tell the buyer, the consumer, where and when these seed were grown.

Why is that necessary? Rye does not germinate very well after the first year, comparatively worthless. But a seed dealer of this country invests \$100,000 in rye seed at a fancy price, but has 50,000 bushels

left over. Those seed were bought in 1911 and grown in 1911. He is not going to lose any money on it. What is he going to do? Is he going to sell them to the farmers of Tennessee straight? No, they would catch up with him. It would not come up. What does he do? He buys 50,000 bushels of a new crop. He mixes them half and half and sells to you for seeding purposes in the year 1912-1913. The result is that you get a half stand of rye all over your farms in Tennessee that included his trade. You attribute this to a freeze-out or some pest, when, in fact, you had been swindled by an unscrupulous seed dealer out of \$150,000.

Gentlemen, that is part of the work of the Department of Agriculture, the enforcement of these laws. Since October 1 I have been entrusted with the enforcement of the fertilizer laws. These fertilizer laws, I will admit, at the present I know very little about, but there is one point I do know, that no fertilizer manufacturer in this State, or out of it, is allowed to ship fertilizer in bulk. I wish you would just remember that one thing. If any fertilizer comes to your locality in bulk, notify the Department. We will appreciate that. That does not mean raw phosphate rock, or lime rock, but complete fertilizer. Neither does it include the materials for mixing fertilizer. If you will notify the Department you will do a service to your neighbors.

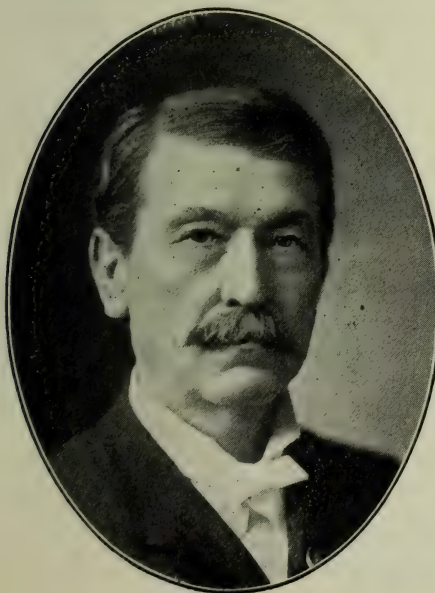
Gentlemen, in order to complete the program the scene will have to change on this platform rapidly. I thank you very much for the very kind and courteous attention that you have given me.

THE RAILROADS AND THE PEOPLE.

Owing to the illness of Col. Robert Gates, Industrial Agent of the Louisville & Nashville Railroad, his address was read by Mr. Dorsey Hudson. Col. Gates requested Mr. Hudson to extend greetings to the farmers and express his regret that he was unable for the first time in fourteen years to be present with them. His address follows:

LADIES AND GENTLEMEN: On a public occasion several years ago, during a session of the Legislature, President Finley, of the Southern Railroad, greeted me as the farmers' friend. I felt flattered at the time and have grown prouder of the title with years. As the "farmers' friend," I desire to call your attention, briefly, to two things of importance, especially so to the farming interest, the interest that always first feels the bad result of demagogic agitation and legislation.

First, I call your attention to the recent amendment to the National Arbitration Act, which provides



that the grievances of employers representing railroad organizations may be considered as well as the grievances of the employees. This looks like a check in the radical progress of arbitrary regulation and one-sided consideration of issues affecting railroads. Until recently the tendency upon the part of the Government has been to listen to only one side of the controversy—that of the employees. Now, if the act was further amended so as to open the door of arbitration to both sides of the controversy, upon application of either party for a hearing, then a spirit of fairness would be established that has not heretofore existed.

Regulation, State and National, and legislation in favor of labor organizations without regard for the interest of others, has about reached the limit of sanity and safety, and the familiar shadow of Government ownership frowns menacingly. The truth is, there is comparatively but a short step between regulation, State and National, as now developed, and Government control in full, which later would mean National ownership—an immense if not fatal stride toward political socialism. Of all the isms of modern unrest and agitation, Socialism menaces the people, especially the farmer, most dangerously, for it not only means Government supervision along all lines of activity, but the destruction of the home—the fountain and the reservoir of patriotism.

Secondly: We have congratulated ourselves for years on the state of peace and good feeling existing between the people and the railroads in Tennessee. While our sister States around us have been reaping the bitter and costly fruits of agitation, lawsuits and uncertainties, Tennessee has been at peace, and the people and the railroads in this State have been in cordial co-operation in developing the primary interest of the State—the farming interest. In this good work the railroads have not been stinted in the matter of expense or service. Every educational move made by the Department of Agriculture of this State has been liberally seconded by the railroads.

Why shouldn't the railroads co-operate with the Agricultural Department? The interest of the farmer and the interest of the railroads are so interwoven that you can't help one without helping the other, or *vice versa*. Good results of this co-operation are apparent in the improved condition of the farming and live stock interests, the educational interests and the good roads movement throughout the entire State. In spite of the fiercest and bitterest factional agitation along political lines, the radical and questionable schemes resorted to to get an advantage of the one over the other, and the unfavorable impression the political conditions in this State have made abroad, the farming interests of the State have prospered in a high degree. Aside from extravagance—the result of factionalism run mad—Tennessee has escaped many of the burdens that her sister States are suffering by the demagogic war of politicians on railroad corporations.

While this is all true, I regret to say to you that there are evidences of a serious attempt to disturb the peaceful and profitable relations existing between the railroads and the people in this State, and to foist upon the people a bitter and costly agitation from which

many States are still suffering. A few gentlemen in office, and some who are seeking office, seem to feel that their only chance to succeed is through excitement of prejudice, appeals to ignorance, the magnifying of small mistakes, misrepresentations and reckless assertions directed against the greatest and most important, the most helpful and liberal of the State's great interests—the railroads. They are dealing in "old bird nests," long settled issues, and digging down into the depths for something on which they may use the demagogic muckrake. They need an issue, and an issue they must have at any cost. The issues upon which they have worked threaten to break from under them.

It is a matter of current report that several of the large cities of this State have secretly combined through their bosses to control the next Legislature. These cities are boss-ridden and will continue to be, it is confidently expected by the bosses. One of their purposes is to ornament their respective cities at the expense of the railroads, without check or division, and the country community—first, by throwing sand in the eyes of the farmers in an agitation for radical rate reduction and in increased taxation; then by changing the taxing laws that give the country counties their fair proportion of the railroad taxes. Under the present law all the trackage of the railroads, including sidings, yards and terminals in the cities, are assessed as a whole and then distributed among the counties according to the number of miles of main line in each county. It is proposed to so change the law as to assess everything belonging to the railroads, off of the 50-foot right of way, as localized property, thus increasing the revenues of Shelby, Davidson and a few other large counties, and decreasing the revenues of the smaller counties. This in the face of the fact that the large city trackage is due to the traffic from and to these counties—thus establishing their equitable right to an interest in the city terminals and extra trackage.

It will be a sad day for Tennessee when the city bosses, like those in New York and Pennsylvania, rule in legislation. The farmer has everything to lose and nothing to gain by this political movement of the city bosses.

Though physically weak, I could not resist the impulse to present these things to the farmers of this State. I am so profoundly impressed with the danger to the farming interest and the farming class in alliances sought to be made by special interest, political and material, and in the triumph of this city movement that I could not refrain from presenting this paper with its facts and forewarnings. It is the glory of the farmers of this State that they stand as the peacemakers between warring interests. So long as this proud attitude is maintained by the great foundation body of the republic the country will be safe.

Hoping that I may live to see the rural schools of this State full high advanced in curriculum and efficiency, with libraries in every school, good roads in every county, the spirit of cooperation abounding, and the farmers of the State prosperous and happy and exercising that conservative influence in public affairs which is theirs by virtue of

environment, I repeat that I am proud and happy to be the "farmers' friend."

Motion was made by W. W. Ogilvie, of Marshall County, and seconded, that the thanks of the convention be extended to Colonel Gates for his interest in this Institute, and with best wishes for his recovery. Motion prevailed unanimously.

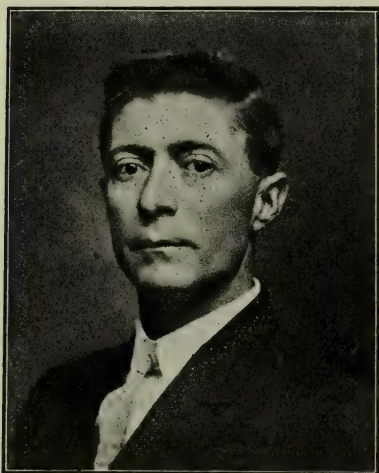
The meeting was then adjourned until 1:30 P. M.

AFTERNOON SESSION.

At 1:30 o'clock the convention was called to order by President Gallagher, who then introduced Mr. R. T. DeBerry, Assistant Commissioner for West Tennessee. Mr. DeBerry spoke on "Important Factors in Crop Production." His address follows:

IMPORTANT FACTORS IN CROP PRODUCTION.

MR. CHAIRMAN AND GENTLEMEN:



I am not going to attempt this afternoon to discuss all the important factors in crop production. The factors which I shall discuss are the breaking of your land, the preparation of the same, the cultivation of your crop, the selection of seed and the spacing of your plants on the land. Now, there are a number of other factors which enter into this.

I am going to discuss first the question of breaking your soil. I am going to discuss deep breaking and how to break it deeply. In the first place a man always wants—why you break that land deeply to know why he is going to make a

change. Breaking land deeply is a relative term. On some lands it might not mean breaking more than six inches deep; on some others it might mean breaking anywhere from twelve to eighteen inches deep.

You know that the action of the elements, the air going down into that soil and aerating it, the freezing and the thawing and the action of the sunshine are what make available the elements of plant food in your soil. You heard what Professor Morgan said about potash. Now, to make this available you must expose it to the action of the air. There is this fact about our soils which a great many do not understand, and that is that our subsoils contain approximately the same amount of plant food as our top soil, with this exception: the plant food in your top soil is immediately available; that in your sub-

soil must be brought up to the surface so that it may be made available. The deep breaking accomplishes this.

There is one sort of soil I have never found it worth while to break deeply, sandy soils or light loamy soils. All soils that are of a stiff nature, or underlaid by a heavy clay, it will pay you to break deeply. Another benefit of breaking deeply is that it allows the spring rains to go down into that soil, instead of running off over the surface and carrying away your plant food.

You want to so break that land that every bit of the water that goes down at any season of the year will go down through that soil, rather than off on the surface. There is this further advantage about deep breaking. Most men think that if they break their land deeply it will be so soft they cannot walk on it. That will be true for only a few hours after a rain. You will find that deeply broken land will allow you to get on it earlier in the spring than if it were not broken deeply. The water will go down and you can get on it from twelve to forty-eight hours earlier than you could the same land if it had been broken shallow. I mean by shallow four or five inches deep.

I want you to remember just this point. I am talking to you about producing a crop. This speech is not complete, but if you will take what I say this afternoon in connection with what Professor Morgan said this morning, then you will have a complete whole. Professor Morgan's talk this morning was along the lines of permanent agriculture and the two naturally fit together. Mine is for the production of crops, something to sell to enable you to educate your children and live on, simply farming your land for all there is in it. Professor Morgan's is for the future, and you want to consider these addresses together.

Now, there are three methods of deep breaking: There is a special deep-breaking machine known as the Spaulding deep tillage machine. Another method is to use a mold-board plow followed by a subsoil plow; and you all know about the use of the simple disc plow. Now, of the three methods I prefer the ordinary disc-breaking plow. I was talking to a man who uses the Spaulding deep tillage machine, and he told me that it took at least eight mules to keep that plow going for a steady ten-hour workday. This only holds good where you are breaking 16 to 18 inches deep. This machine is entirely too expensive; in fact, it is out of reach of from 90 to 95 per cent of the farmers of Tennessee. The greatest objection I see to the machine is that the front disc only goes about 6 inches deep and the back disc brings a good deal of that old clay sub-soil up on top of the other.

The other method of breaking is breaking with the ordinary disc plow. You can get them in the rigid frame, or what is known as the reversible disc. In my estimation that is the best breaking tool we have today. We broke last fall, beginning the 15th of October and continuing for a month or more, some fifty or sixty acres of land. The land was in the best shape when we got through with it of any land I have ever seen broken. The plow that is in reach of every man in the State of Tennessee is the ordinary two-horse mold-board breaking plow, followed with a sub-soil plow. Men can work that by combining

their teams. It takes four mules. If a man has two good mules he can exchange work with his neighbor, and it is this class of farmers, gentlemen, that we must consider here in the State of Tennessee if we expect to develop the State to the fullest extent along agricultural lines. The men who are able to buy the Spaulding deep tillage machine are able to take care of themselves. It is not that class of men that the Institute worker is trying to reach. The breaking plow and sub-soil plow would cost in the neighborhood of \$20.00. These disc-breaking plows of the single disc type will cost anywhere from \$30.00 to \$40.00 up to \$50.00. This disc plow will take three good mules to do anything like a good day's work.

Either of these methods now will accomplish the purpose of deep breaking, and that is what you must do if you are going to get the best results.

After the land is broken the next thing to consider is the preparation of the soil. Every man knows that it is a good deal easier to prepare the land before you get any seed or plants on it than it is to wait until after you get them on. You can prepare that land by a number of different means. You can use the ordinary section harrow, or you can use the disc harrow, but you must prepare that land just as thoroughly as possible before you put any seed into it.

You understand all plants take their food up from the soil in solution. You want to prepare that land just as thoroughly as possible so that the water carrying the plant food will be just as little obstructed as possible. An ideal condition of the land would be to get it in the condition of fine meal. In West Tennessee we have a good deal of sandy soil and it is very easy to get this into that condition. Sometimes it is a good deal more work for you, but you had better put that work on it before you put your seed in. You can do it more cheaply. The great element of cost today is the man labor you put on it, and you want to manage your crops so as to save as much man labor as possible.

Another important matter: My friend, Mr. Garrison, who has given the subject a great deal of thought, says that this is worth more than any other factor—and that is seed selection. Suppose there is 10 per cent of your grain that never comes up, you stand no show for making a full yield. In the matter of selection of seed I am going to discuss this largely from the standpoint of corn growing, but remember it is just as appropriate to the growing of cotton. The ideal way of getting seed corn is to have it far enough away that it will not mix with your neighbor's field. The pollen from a corn field will go probably a half mile, so in growing your patch of corn for seed you

want to get it as far away as possible from the other corn. You want to take pains with that patch; feed it a little bit more than you do your other corn. It takes food to develop a good plant. When the grain comes on that plant you will have a grain of seed with much more vitality than you would on a poor piece of ground. That has been tried out and determined to be an absolute fact. If you will use just a little fertilizer or barnyard manure, anything to stimulate the growth, you will have a stronger seed than if you go into the fields that have not been cared for. If you do not want to go to the trouble of having a special seed corn patch, go into the field and select the corn. You can select any type of corn you would like and in three or four years have a type of corn that would exactly suit you. If you are going to sell it of course you want a type that commands the readiest sale in the market.

After you have gotten your seed I suppose most of you test these seed for vitality. You can test it readily. Take a few grains, say a half dozen, from an ear of corn, and you can determine the germination. If it germinates 90 to 95 per cent you can use it, but it is better that every one of those grains sprout.

But after you have selected this corn, or any other seed that you are going to use, and go to put it into the fields, see to it that you properly space those plants. Plants, you know, demand air. If you crowd your plants you do not get the full benefit of the land, so that you want to properly space it and space it evenly from one row to the other. Some ground would demand that you put rows from $4\frac{1}{2}$ to 5 feet apart for corn. There is other land in the State where you could grow good corn with less space between the rows. It matters not how you space it so you space it uniformly. That counts a great deal in the production of corn plants, or any other plant, as they all get about 95 per cent of their plant food from the air. You want to get those plants spaced so as to get full benefit of the air. Be sure to give your plants uniform spacing.

For the last few years we have been giving a great deal of attention to the growing of cotton. We have been spacing our rows about the width that the cotton plant is high. That is, if the cotton plant grows 4 feet high we make the rows 4 feet apart. On most of our land we space the plants in the drill from 18 inches to 2 feet apart. This year we are getting pretty nearly a half bale to the acre on land that would ordinarily require four to five acres to make a bale, simply because we have given our plants proper space.

DAIRYING IN TENNESSEE.

Mr. J. R. Keithley, of the United States Department of Agriculture, Dairy Division, delivered a very interesting address on "Dairying in Tennessee." His address follows

MR. CHAIRMAN, LADIES AND GENTLEMEN :



I have been called upon to discuss dairying in Tennessee, and I feel my inability to do the subject justice and to present to you the great natural facilities that make Tennessee potentially one of the most important dairy States in the Union. When we look at dairy statistics, however, we are somewhat disappointed at its standing with relation to the dairy States of the North, where natural conditions are no more favorable to the industry.

Now before beginning a close scrutiny of the dairy statistics, permit me to take a look at the State in a general way and then we can

make a more interesting detail study of it.

The State, as you all know, is naturally divided into three distinct sections, viz.: West, Middle, and East Tennessee. Now, each of these parts has topographic features which are more or less peculiar to that section alone. The State as a whole varies from the level, undulating and hilly, to very mountainous territory. It rises from 250 feet above sea level along the Mississippi River hills to altitudes in excess of 3,000 feet in the mountains along the eastern border. Now look briefly at each section.

West Tennessee consists of that part of the State which extends from the Mississippi River eastward to the Tennessee River, and is on the whole level and well adapted to cotton, grains and grasses. The soils are largely heavy loams and clays in the alluvial bottom lands along the Mississippi, while the loam covering of West Tennessee gives rise to large stretches of silty loams. Along the Tennessee River the coastal plains soils are principally sandy and sandy loam.

Middle Tennessee consists of that part of the State which stretches from the vicinity of the Tennessee River eastward to the Cumberland Plateau. This middle section consists of two main parts, viz.: the elevated Highland Rim and the centrally located Limestone Basin. The Highland Rim reaches altitudes of 1,200 to 1,400 feet along its extreme eastern margin, while the Limestone Basin is undulating to hilly with altitudes of from 500 to 900 feet. The soils in the Highland Rim section consist principally of gray, silty and stony loams, and heavy clay soils; while in the Limestone Basin the soils are the

brown, silty and clay loams, which are very similar to those of the blue grass section of Kentucky, the Great Valley of Virginia and the limestone valley of East Tennessee.

East Tennessee consists of the Cumberland Plateau and the great limestone valley in the eastern part of the State. The valley is a continuation of the Great Valley of Virginia, and is bounded to the east by the Appalachian ranges along the extreme eastern line of the State. The soils of the plateau are derived principally from sandstone and shale rock and consist of loams, silty loams and prevalently of fine sandy and stony loams. Within the Appalachian Mountain region the soils are chiefly derived from the sandstone and shale rocks and are similar to those of the Cumberland Plateau.

Now, most of these soils, as you know, give rise to fine grazing lands and are in many sections very fertile. They wash easily and unless properly handled or cultivated soon become badly washed so they can be cultivated only with difficulty. This fact, coupled with the grazing features, favors the adoption of live stock farming rather than grain farming.

Now, dairy farming is one of the most profitable forms of live stock farming, and has proven to be the one which supplants other forms as the population increases and land rises in value.

It is now conceded by authorities that the conservation of the fertility of the soil is the greatest problem of agriculture. There is some difference of opinion as to whether soil fertility can be maintained where grain crops are sold from the farm. On the other hand, it is certain that whether it be possible or not, it is seldom done. So far in our history grain selling has meant selling fertility that has been stored up in past ages and has been followed by impoverished soils and unprofitable agriculture. In contrast to this condition we find farms in almost every community, and even entire countries can be pointed out, where the fertility of the soil has been vastly increased by live stock farming. The most marked examples of this are in connection with dairy farming.

Prof. C. H. Eckles, Professor of Dairy Husbandry at the University of Missouri, and one of the leading authorities on dairying and related subjects, gives a table showing the fertilizing constituents of common feed stuffs and dairy products. He calculates the value on the basis of nitrogen at 20 cents per pound and phosphoric acid and potash at 6 cents per pound, which values are in use at present by chemists who inspect and analyze commercial fertilizers. That table I have placed before you.

Fertilizing Constituents and Value as Fertilizers in 100 Pounds.

	Nitrogen	Phosphoric Acid	Potassium Oxide	Value per Ton as Fertilizer
Corn fodder (with ears)	1.76	.54	.89	\$ 8.76
Mixed hay	1.41	.27	1.55	7.82
Timothy hay	1.26	.53	.90	5.78
Red clover	2.07	.38	2.20	11.38
Alfalfa hay	2.19	.51	1.68	11.39

	Nitrogen	Phosphoric Acid	Potassium Oxide	Value per Ton as Fertilizer
Cowpea hay	1.95	.52	1.47	10.19
Wheat straw .....	.59	.12	.51	3.12
Corn	1.82	.70	.40	8.60
Wheat	2.36	.79	.50	9.59
Oats	2.06	.82	.62	9.97
Bran	2.67	2.89	1.61	16.08
Gluten meal	5.03	.33	.05	20.58
Cottonseed meal	6.64	2.68	1.79	31.92
Linseed meal	5.78	1.83	1.30	26.90
Milk .....	.53	.19	.18	2.56
Cheese	4.52	—	—	18.08
Butter .....	.16	—	—	.64

An examination of this table shows that in proportion to their market value dairy products take but little fertility from the farm. Wheat at \$1.00 per bushel is worth \$33.32 per ton, while it carries with it elements of fertility worth \$9.59. Corn at 60 cents per bushel is worth \$21.40 per ton and removes fertility worth \$8.60. A ton of oats at 40 cents per bushel is worth \$25.00 and removes \$9.97 in fertility. A ton of milk at \$1.50 per hundred pounds is worth \$30.00 and removes \$2.56 worth of fertility. Now, if we compare the fertility removed when cream or butter is sold the results are even more striking. Butter fat contains only carbon, hydrogen and oxygen, and has no value as a fertilizer. The only element of fertility in butter and cream is the small amount of nitrogen in the milk constituents in cream and butter besides the butter fat. In butter, as will be noticed in the table, the value removed in a ton is 64 cents, while the market value of the butter is, at 40 cents a pound, \$800.00.

Now, after this brief glance at what the dairy cow removes from the farm in elements of fertility, let us look with interest at what she adds in the form of elements of fertility.

A dairy cow weighing 1,000 pounds, according to Eckles, voids about twelve tons of solid and liquid manure in a year, worth on the basis of elements of fertility contained to it, about \$30.00. The experiment stations of Minnesota and Ohio found from actual field experiments that barnyard manure has an actual value of \$2.50 to \$3.50 per ton when applied to the land, depending somewhat on the fertility of the soil. Under good conditions at least 80 per cent of the fertilizing constituents of manure may be returned to the soil.

This, however, isn't all that can be said of dairy farming. The dairy farmer purchases grain instead of selling it, and in that way is constantly adding to the fertility of his land. The purchase of concentrated feeds, rich in protein, as will be seen in the table, add a large amount of fertility to the farm. The keeping of dairy cattle, as suggested before, usually results in the greater part of the farm being kept in grass, which makes it possible to prevent washing of the soil. Washing, as we all know, is one of the great factors in rapid deterioration of many farms.

In many foreign countries, especially Denmark, Holland, Germany and some parts of England, where dairying has been followed for a period of years, the productivity of the farms has been greatly increased. However, we do not have to refer to foreign countries to bear out this statement. I am sure there are gentlemen in the audience who have seen the same condition result here on the farms of Middle Tennessee, which is one of the most favorable sections in the State for dairying farming, on account of its soil, climate and markets.

Thinly settled regions are, as a rule, not dairy sections. When land becomes high in price and it is necessary to secure a correspondingly larger income, the dairy cow usually comes into use. Exceptions to this may be rich level land that can be used for grain for long periods without exhausting the available fertility. Dairy farming is an intensive form of agriculture and can be successfully followed on comparatively small areas.

Farmers' Bulletin No. 242, of the United States Department of Agriculture, gives an example of what can be done on a small fertile farm. This particular farm is located in Pennsylvania and consists of seventeen acres. Milk amounting to \$2,400.00 per year and young stock amounting to \$500 were sold. Of feed there was purchased \$625 worth. In Denmark, Holland and the Isle of Jersey dairying is profitably followed on land worth from \$1,000.00 to \$2,000.00 per acre.

The Missouri Experiment Station has gathered data showing that a Holstein cow producing 18,405 pounds of milk per year produced more food nutrients in one year than was contained in the carcasses of four 1,250-pound steers. This milk contained 2,218 pounds of nutrients as compared with 548 pounds of nutrients in the carcass of a 1,250-pound steer.

Another advantage in the dairy cow is the constancy and certainty of returns. This appeals to the farmer with small capital as readily as to the man of larger means. Dairying is not a speculative business. The returns at any one time are not large, but they are coming in constantly, throughout the year, and can be depended upon. The market price varies probably less than any other farm product. It is what might be termed a "money crop," because the cow is constantly converting all crops into a marketable product.

The question of labor is probably the greatest difficulty experienced in conducting a dairy farm. This difficulty is generally caused by the necessity of treating a cow carefully at all times, and the further fact that the work becomes somewhat monotonous as a result of having to be done regularly every day.

Although the labor problem is a serious one, it is no more so than in almost any other line of farming. Under proper conditions it may be less. The grain farmer crowds his work into a few months and requires a large amount of help for a few weeks or months only. He finds it hard to obtain because he has nothing to offer for the remainder of the year. Dairy farming, on the other hand, is distributed throughout the year and gives steady employment.

The most frequent objections raised to the labor on dairy farms are the long hours, the steady regular work, and the nature of the

work. To reduce the labor problem to the minimum, first, the hours must be made as reasonable as in any other kinds of farming. Second, each laborer in turn should have a regular time off duty.

The objections to the nature of the work are based almost entirely upon the conditions under which the work is done. Those conditions can be removed or made more favorable and pleasant if the cows are milked in a clean, well-lighted, comfortable stable at reasonable hours, and modern methods of handling the manure and feed by overhead carriers are used. In many localities a man with family may be employed with best satisfaction to the employer if a comfortable house is furnished to the man and family.

Now, with the foregoing general considerations in mind concerning the topography and soils of the State, and the advantages and disadvantages of dairying, permit me to state some facts as shown by the United States census reports relative to this State.

It is seventeenth in population, thirty-third in area and twentieth in dairying. It is surpassed among adjoining States in total value of dairy products sold from farms (excluding home use of milk and cream) by Kentucky alone. Kentucky sold \$9,056,000, while Tennessee sold \$8,715,000 worth of dairy products. In value of dairy herds it is also surpassed by Kentucky. The herds being valued in Kentucky at \$13,726,000 and in Tennessee at \$12,000,000. From the only comparative figures available we, however, see that Tennessee has made a greater progress in the past decade than Kentucky. The increase being respectively 36.9 per cent and 25.2 per cent.

The extent of dairying in Tennessee is shown forcefully by the following figures taken from the last census report for the year 1909:

Milk produced, gallons	117,101,970
Milk sold, gallons	6,814,209
Cream sold, gallons	145,976
Butter fat sold, pounds	32,345
Buttter produced, pounds	39,827,906
Butter sold, pounds	9,009,207
Cheese produced, pounds	18,592
Chees sold, pounds	11,883
Value of dairy products	\$ 8,715,441
Receipts from sale of dairy products	3,211,978
Number dairy cows on farms reporting dairy products.....	365,192
Number dairy cows on farms reporting milk products....	358,917

These statistics further show that practically all butter is produced on farms and little or none in creameries. Statistics show the average price of creamery or factory butter to be 28.73 cents per pound. The average price of the 9,009,307 pounds of butter sold in Tennessee was 21 cents per pound, or 7.73 cents less per pound than the creamery butter. Now, the question naturally arises, Was the quality of this butter at fault or was the system of marketing poor? Whatever the cause the result was a loss of approximately \$700,000 to the dairy farmers of the State.

From my limited knowledge concerning the quality of farm butter

made in Tennessee I would not hesitate to say that there is much room for improvement. The markets for dairy products are abundant but not as accessible as they should be. The question then naturally arises how can the quality be improved and how can the markets be made more accessible? The quality of the farm butter depends as much upon the condition of the cream and methods of manufacture as upon the subsequent changes.

Markets can be made accessible in the same way that they have been made in the Northern States, viz.: through the establishment of creameries. But care should be exercised in the establishment of a creamery. The product of from 400 to 600 cows within a five-mile radius is absolutely essential before a creamery can be very profitably conducted. These creameries may be either proprietary or co-operative. Either, if properly managed, will prove profitable and an immense help to any community on account of the stimulating effect it will have upon the dairy industry in that community and the improvement of farm lands as previously discussed.

Now, it is evident that in many localities a period of transition is or will be necessary. The question arises how can this transition be made? The answer comes in the form of *farm butter-making*. Numerous instances of great profit are found in practically every community or neighborhood, where some progressive farmer is making all of his dairy produce into butter or buttermilk. This is particularly true in the South where buttermilk is such a popular drink.

The Dairy Division of the United States Department of Agriculture, realizing the difficulty connected with this problem, has undertaken the work of assisting and encouraging the increase in dairy farming during this period of transition or change so that it may soon become general and extensive enough to make a creamery in every community a possibility and a help. This can be done by making butter production on the farms possible until the farmers in a community get together enough cows to support a creamery.

The demand of Southern cities for dairy products is generally known to be supplied largely by the dairy States of the North. The question naturally presents itself—why does not the South, with its excellent cropping season and climatic conditions, which favor dairying, become not only a self-satisfying section, but a producer beyond its needs?

The study of conditions in Tennessee, Kentucky, North Carolina and Virginia indicates that all of those States are alive to that probability and are progressing not slowly but rapidly into the dairy industry.

This development is most rapid and marked in the immediate vicinity of cities—both large and small. This is due to the demand and ready market for dairy products. As a general rule, these areas in which dairying is developing are generally extending in ever widening circles, which will sooner or later merge or coalesce with those of neighboring areas and form one extensive dairy section, familiar in many respects to those found in Wisconsin, Minnesota, Iowa, Illinois and New York.

The larger herds are at present within comparatively short distances of the cities. The sections or communities more remote have smaller herds, varying from one to twenty-five cows per farm. These are kept only to supply the demands of the family and the surplus, which in a majority of such cases is so small as to be unimportant from an economic viewpoint, is disposed of at a loss, largely because of its quality and the distance from markets.

Within the radii from which the cities draw their milk, cream and ice cream supplies are to be found progressive dairymen who are making all of their dairy products into the form of butter and are supplying individuals, hotels, clubs and retail grocery stores with a (fairly) good grade of butter. It is this class of dairymen who are going to be most easily interested in improvement and whose success will be most influential with the dairy farmer in adopting more extensive dairying. This is an apparent fact because these larger butter producers are making sufficient quantities so a small profit per pound will in the aggregate be attractive and helpful from an economic standpoint.

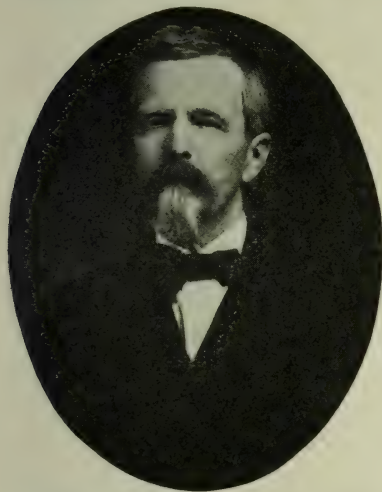
The smaller dairy farmer, farther from the markets, will realize that he can make butter as cheaply as the man nearer town, and seeing the profit the larger farmer nearer town is making will be encouraged in increasing the size of his herd and becoming a competitor in supplying the city's demand, which is ever growing.

Now, in this discussion of dairying in Tennessee, we have endeavored to show that some of the factors which make Tennessee potentially one of the greatest dairy States in the Union are, (1) that some form of live stock farming is adapted to the needs of the soils of the State; (2) that dairy farming in particular is well adapted to fulfill those needs; (3) that dairying bears a very important relation to continued soil fertility; (4) that it can be profitably followed, and, from the standpoint of labor, the difficulties are not insurmountable.

I have further given a satisfactory survey of the dairy industry of the State and have attempted to indicate briefly one way in which the industry may be extended to sections now remote and to which markets are inaccessible. This will be an extensive work and developments may seem slow, but results must crown any properly directed effort that receives the cooperative support of the educational forces at work, and the men directly interested.

INTELLIGENT USE OF COMMERCIAL FERTILIZERS.

Jesse Tomlinson, Assistant Commissioner of Agriculture for Middle Tennessee, made an interesting address on "Intelligent Use of Commercial Fertilizers." His address follows:



GENTLEMEN: I want to talk to you a little bit on the use of commercial fertilizers. It has grown to such proportions in Tennessee that I think it should have more than passing notice.

The farmers of Tennessee last year expended about two million dollars in commercial fertilizer. I think I am conservative when I say I do not believe one in five knew what he was doing, or got any special result from the use of his money.

Now, when I commenced three years ago as an Inspector of Commercial Fertilizer there were about 38,000 tons used in the State; last year there were something like 65,000 tons used; the indications are there will be something like 100,000 tons used this year. Some counties in the State now do not use it at all. It is increasing rapidly, and we will all get to using it.

I think that we should understand what we are doing when we do spend our money for it. The most of the farmers are buying a brand. The brand is not worth the snap of your finger. It is the plant food you want; it is the formula. To show you how farmers frequently buy it I have been at the dealers' warehouse when a wagon would drive up and a farmer would come in and say, "I want a good corn fertilizer. Can you tell me what to get?" The dealer would reply, "Yes, I have it in the house: it is the Bear brand, Bull brand," or some other brand. The manufacturers of commercial fertilizers dub their products with just such names as they think will catch the eye of the farmer. If I were to ask you right here what your formula was, I don't expect more than one in five could tell. You could tell me what brand. Now, that is not the thing. We want to buy, when we buy commercial fertilizer, pounds of plant food and not tons of commercial fertilizer.

You take this formula: Suppose you have 10-2-2. How much plant food have you in that? Ten per cent of a ton. Ten per cent of a ton is 280 pounds of plant food you have in a ton. What is the balance in that ton? What is that other 1,720 pounds? Why, frequently it is cinders ground up, or sand. Something that has no plant food whatever—perfectly worthless. You pay the freight for that 1,720 pounds of worthless stuff simply to get 280 pounds. You not only do that, you pay for the sacks that contain it. Now, I say that is not business.

The mixing of commercial fertilizer for practical purposes is not a difficult problem. You know you can take it and shovel it about until you get it sufficiently mixed for practical purposes. The manufacturer has to have machinery to mix it, because his analysis has got to come up to his guarantee and he has got to be particular. But for practical purposes this is not so necessary.

Now, I want to say to you that the intelligent way to buy it, the business way to buy, is to decide what plant food you want and order the plant food and do your own mixing.

Then another thing: You want to know what you want. The State Chemist gave me the analysis of some soil that was taken from four different sections of a field in Davidson County here today. It varied considerably, those four different samples taken from the same field. It not only varied materially, but he could not tell how much of that would be available to the crop, so you cannot rely upon a soil analysis. You ask, then how are you to know what your soil does need? There is but one way in the world. It is like every other important fact. You have got to take time and do your own experimenting. If you have four valuable horses that you think a great deal of, I will guarantee you feed those horses differently. You understand those horses. You ought to understand each one of your fields just like any valuable animal.

There is another thing: I say the first thing is to know what the plant you are going to plant feeds on. The next thing to know is to know whether any of those foods are lacking in your soil, and know in what condition to put your soil in order that the plant food becomes available to your crop.

Now, you have heard all these things about plowing deep. If you will remember, our scientists tell us there are thirteen or fourteen elements; nine of these elements are in the soil already; four of the elements which make about 95 per cent of the constituency of our crop are in the air and the water—nitrogen, oxygen, hydrogen and carbon.

Now, before you can get those plant foods in the condition for the crop to take it up you have got to get it in the soil. The soil is nothing but disintegrated rock, and before these mineral elements become available they have got to come in contact with the air and the water.

Now, you know we have been plowing three or four inches deep, and we have used the plant food out of that. With our ancestors when they wore a field out the problem was to go and clear another field. Now, we have got to change our plan. Those minerals are several feet in the ground, as well as several inches, so that if you will get your soil so that the water and these elements from the atmosphere will go down several feet in the soil you make the plant food in that soil available for several feet. You have been told how to do that: Plow deep, sub-soil your land, keep the top of your seed bed well pulverized so that the rootlets can have room to gather their plant food.

Now, these things we have got to go to thinking about. We have been miners. We have mined this plant food out of the surface of our soil and shipped it off as grain and other products. We have got to

change our methods. We can say what we please about these scientific methods being wrong; about the men who "never pulled a line over Old Beck"; but we must realize that these are facts and we must come to them. We have this world to feed. We are 35 per cent of the world's population, and we have to feed the whole 100 per cent, and we have to do it upon a soil that has been depleted of a great deal of its soil fertility, and we have got to keep that soil fertility up for future generations.

In making this talk to you about commercial fertilizers, I know some of you do not use it, but you do not know how much they use on the Cumberland Plateau and the Highland Rim.

Now, gentlemen, think of that two million hard earned dollars the farmers of Tennessee have paid out, and I say not one in five knows what he is doing. He believes in some mysterious way that commercial fertilizer will assist his crop. He does not stop to think that his plant has to be fed just like a young animal. Those plants are starving for the want of something to feed on. He thinks anything under the name of a commercial fertilizer will do. We have got to get out of that; we have got to know what our land needs; we have got to know what condition our land is in and we have got to know what to put on it.

Now, I want to say that of all these plant foods it seems there are only three, because we call a commercial fertilizer that contains them all a complete fertilizer; that is, phosphate, nitrogen and potash. Nitrogen is the most costly and nitrogen is the only one the farmer can manufacture. Three-fourths of the nitrogen is in the air and we have to get that nitrogen into the soil, which we do by the nitrogen-raising plants, such as peas, beans, etc. It is all within our reach. We can manufacture all the nitrogen we want. We cannot manufacture potash. We do not need that if we handle our soils in a way to get the potash available in the sub-soil. So it is with phosphate; nearly all our soils have plenty of phosphate. If we will handle our lands right we do not need it. Consequently, we here in the Middle Basin do not need to buy any commercial fertilizer—raise these legume crops, manufacture your own nitrogen, plow your land deep, so that the air and water can get to it.

Now, gentlemen, I am much obliged to you for your attention. I have no idea that the majority of you thought anything about the Middle Tennessee farmers being out so much for commercial fertilizer.

DISCUSSION.

Captain T. F. Peck—Ever since I have been connected with the Department of Agriculture I have been trying to emphasize the importance of getting your soil right. That is the first thing to do if you are going to use fertilizers, or if you are not going to use them. Men come to us wanting soil analyses made. I tell them it is the last thing they need to do. There is no difference in the top soil you are cultivating and the subsoil beneath, other than the vegetable matter that has been added. Now, if we want to build up our soils, if we want to increase their fertility, all that we have got to do is to follow nature's plan.

If we want to build up the soils of Tennessee, if we want to get more out of them for cultivation, the thing we want to do is to add vegetable matter, plow deep, get rid of your hard-pan, make the plant food available, then study the crop foods you grow on them, and any man can tell whether it is nitrogen, oxygen or potash that is needed; then add that thing.

If you will remember in my address yesterday morning I tried to emphasize this very use of the commercial fertilizers; in fact, making the soils in such condition that the plant can get the benefit of the plant food. The better condition we get our soils in, the more vegetable matter, the more fertilizer we could afford to use with profit, and the poorer the soil the more sparingly you should use your fertilizer.

In this connection there is one thing I wanted to bring before this convention: There is one element of farmers that want to see the raw, ground phosphate rock inspected and taxed; there is another element attacks that, wants to outlaw it and not tax it and have it sold as it is now. The point is simply this: Raw ground rock varies considerably in percentage of phosphate, and when ground and sold without any protection the farmer is absolutely helpless and has no recourse if they sell him 2 per cent phosphate, or if it is 25 per cent, and he cannot tell and is simply up against this. Now, do the farmers of the State want this raw ground rock inspected and taxed and pay the price of 50 cents per ton for the absolute guarantee that they may know what it contains, and if it does not contain it they may have recourse on the manufacturer? That is a simple statement. I would like to have this convention go on record, because I am inclined to think that it is my duty to see that raw ground phosphate rock should be inspected and taxed for the farmers' protection.

Delegate—Mr. Chairman, I want to say this before you think about that ground phosphate rock. Now, they are grinding it so that they claim 90 per cent of it will pass through a screen 10,000 meshes to the inch. It is ground as fine as your finest flour. It does not cost half as much as the acid phosphate. Now, if you get a ton of acid phosphate, what do you get? You get 1,000 pounds of plant food and 1,000 pounds that is not plant food. If you would use the same money and buy 2,000 pounds of this finely ground phosphate rock of the same grade you would have four times as much plant food. The acid is not plant food. It is simply there to make the plant food available. It does seem to me that if our soil is in proper condition, with rock ground as fine as the finest flour, that a good big per cent of it would become available right now and the other become available by degrees and last there for maybe five years. Now, I am an advocate of not outlawing this ground phosphate rock. Think about it. If you will send where they grind the raw phosphate rock you take what they say. The fertilizer inspector has no right to go there and take samples of it. The manufacturer can put on it any guarantee he pleases and you have no way of protecting yourself. Let it be taxed then. That means that it is to be sampled and analyzed, and the farmer who uses it knows what he is doing. He is protected. I am glad

Captain Peck brought up that question. I wish this convention would take some action.

Delegate—I would like to ask how soon that phosphate becomes available to the plant food?

Delegate—I say ground as fine as flour it does seem to me that enough of it would become available so as to stimulate the present growing crop. I do not know how much of it.

Delegate—Guess work is not a thing for people to go by. I have had a lot of men come along and say this piece will double the piece over there. I thought it would myself. When we harvested, to my astonishment what we said did not get half as much as the other.

Captain T. F. Peck—About the guess work. Now, we are not doing any guess work, but they are doing guess work as it is. Farmers are taking absolutely all the chances. My proposition was simply a clean-cut business proposition. If that is not available, do you want the farmers to go on paying for it, or do you want to know what you are doing?

J. N. Meroney—I am a dairy man. For about seven years I have been using the ground phosphate rock in my cow stables on the fresh cow manure. I cannot go into exact figures as to the good it does me, but the use of that manure has proven very satisfactory to me. Covering that fresh manure with the finely ground phosphate rock acts, in my estimation, just as well as acid phosphate. I believe there is a substance, a chemical substance of some kind, in the fresh manure that causes the ground rock to become available and to dissolve in water. That is all the acid phosphate is. The sulphuric acid only prepares the ground rock to dissolve in water. The fresh manure will do the same thing in my opinion. You do not add sulphuric acid to your land; you do not want it; you do not need it. It is the most costly part of the fertilizer. It is a drawback to your land. Buy the ground phosphate rock, put it on manure and put it on green stuff and you will get just as good results from it as you will from the dissolved rock with the acid phosphate at half the cost, and you will not add to your soil any acid substance that you do not need. I believe that the ground rock should be taxed so that we will know exactly what is contained in that rock.

Now, I am from the phosphate country, and I know that there is phosphate there that will run 80 per cent phosphate of lime. I know that the rock that will run 80 per cent goes to Germany, France and Italy, and I know that the 40 per cent rock comes to us. I want us to have it taxed so that we will get the good rock.

RESOLUTION.

Upon motion, duly made and seconded, the following resolution was adopted and ordered spread upon the minutes:

Resolved, That it is the sense of this convention that the Department of Agriculture should make a ruling to the effect that raw ground phosphate rock should be taxed as other fertilizer ingredients and classed as a fertilizer.

NASHVILLE INTERURBAN RAILWAY.

Secretary T. G. Settle—If any delegates are here from Williamson County, or any part of that territory touched by the Nashville & Franklin and the Middle Tennessee Railroads, I would like to make a statement on behalf of those roads. When the Commissioner of Agriculture asked the railroads if they would co-operate with the Department in holding this Institute, Mr. Frierson, President, stated that those roads would, and we had the certificates printed so stating. Afterwards Mr. Frierson wrote the Department that if we would furnish the names of delegates to whom his road would be most convenient he would issue individual passes, and we furnished a list from Williamson and Hickman Counties, and possibly there are some delegates here on those passes. Afterwards, Mr. Frierson suggested that those presenting these certificates should take the Louisville & Nashville, and I understand they have been having some trouble. I wish to state that it is not any fault of Mr. Frierson's road. The trouble arose over the short time we had to make all arrangements for the Institute.

VALUE OF GOOD ROADS.

Mr. James Palmer, delegate from Tennessee to the International Institute of Agriculture, Rome, Italy, made an interesting talk on "Value of Good Roads." His address follows:



MR. CHAIRMAN: I will consume but a little of your time on the discussion of good roads. I would not for a moment attempt to say very much about the value of good roads to a community to such an intelligent audience as I see confronting me.

Good roads will bring to your doors many things that you do not now have. It will settle your community; it will bring to you electricity to light your house and run your stationary machinery. Electricity is the cheapest power in the world. It will be a great factor in the parcels post, in your mail man coming to you several hours earlier than he would otherwise. Again, you know you can go farther to church than you could otherwise and have better preachers. Your children can go farther to school, do away with the one-room school-house, have better schools and keep your children at home. And I say God hasten the day when the children will not have to go away from their good homes to school. Good roads bring all these things to you. They are necessary for your enjoyment.

The automobile has created a new era in road building. Formerly the old roads supplied the necessities of the country, because they moved to market their crops in two-wheeled carts, but since the automobile has come, moving swiftly, it takes better roads to accommodate the travel.

In England the burning question is, "Who is going to pay the taxes?" Naturally you say the automobile owners. Whenever you tax the automobile out of existence you will tax yourself out of existence, because it is just as necessary as the railroad is.

Now, as you know, the farmer of England is not like the farmer of America. England is owned by a few people. The majority of the people are the taxpayers, not the rich men. The men rent the ground, and in many cases the majority of ground in middle England rents for four pounds per acre—\$20.00—so you can see that those farmers over there are up in the air and they are up against a hard proposition.

Now, I attended perhaps the greatest road convention that was ever held in the world in England. Those engineers, perhaps 5,000 of them, read papers in their own language and they were translated into English. The question arose, "What is an ideal road?" There was not a man in that convention could answer the question. The County of Kent has had builded twenty-three different kinds of roads. Some of it is macadam. They also use a kind of tar binder. These engineers inspected it, and none of them said it was a proper kind of road.

Also in France a road built by the Government a hundred years ago is now going to pieces, and the same question arises with them, "How shall we build roads that will stand the present traffic?"

Upon coming home I find, after examining the roads in Davidson County, that they are building roads here more intelligently.

Now, in reference to what shall we do to improve the situation, I will give you a little personal experience along that line. I was appointed Chairman of the Memphis-Bristol Highway Commission. I went across this State twice in an automobile. Again I went to Memphis and came back by the way of Jackson. I had with me a good engineer, who is now Chief Engineer of Road Building in Maine. He pointed out to me material for road building along by the side of the road, and showed me that it would simply have to be shoveled in. In some places they have macadam, some gravel and stone. All of these make good roads if they are put with tar-binder. On good roads where there is not much travel it is hard to tell whether you need it or not. But this is a fact, that where you have not those materials, juts a common dirt road, thrown up in the proper manner, is as fine a road for ten or twelve months in a year as any man will want. You can build it for \$600.00 or \$700.00 a mile, and I tell you that there is no necessity for having bad roads in Tennessee. I will tell you again that it is unnecessary to live as we are living in this State with bad roads.

Again, another strong point is the maintenance of roads. Whenever you build your roads put 40 per cent in your roads and retain 60 per cent of that money for their maintenance.

DISCUSSION.

Delegate—I would like to hear from some of the farmers here, with some suggestions as to how we can have good roads.

Delegate from Bedford County—I can tell you how we cannot have them. In my county of Bedford we have miserable roads. We are taxed a certain per cent for roads. We pay two-thirds of that in work and one-third in money. We have a commissioner for each district. He appoints his overseer and when he starts working the road he will throw a few gravel in a few places, and when he gets done you can tell he has gone over the road, but where is the fat? It is in the pockets of the commissioner and the overseer. I can cite a case of a commissioner in my district a few years ago who paid an overseer \$3.00 for sawing a log that was not two foot through and taking it out of the road. He got \$1.50 and the overseer got the other \$1.50. I believe it is that way all over the State. We have got to build our roads by taxes and we have got to have somebody to take charge, and we will have to pay him so much to do it.

Delegate N. F. Boone, of Lincoln County—We have a proposed issue of bonds in Lincoln County. The Legislature granted the privilege of issuing these bonds if the people desired it. Now, I would like to hear from you if you are an expert road man. What would be the safeguards to put around that money to secure the money. I know what is the matter in Bedford County. They have stairs instead of roads, and the trouble is getting the money to build better roads. It is like squeezing blood out of a turnip. We have pretty good roads in Lincoln County, and we are trying to make them better. We want to do away with one-room schoolhouses, and we want to know how to invest that money so that one man will not get it. We want to know just what we can do to get the road.

Mr. Palmer—Your remarks are very pointed. I could not offer the convention any opinion of mine. Every county contains material for road building, and different material. The best thing to do is to have a State commission appointed. Let them hire the best engineer that they can get anywhere in the country, one that is suitable, and pay him for it. Whenever a county wants to build roads, let that engineer go there and in conference with the county engineer lay out a comprehensive system of roads. Let the counties have their boards behind that engineer, without salary, and in that way you will get an honest expenditure of your money. That is, if your county engineer is fit for anything. A merchant cannot cheat, because if he does nobody will trade with him; an engineer cannot cheat, because he will ruin his reputation. You might take a cheap citizen, a little farmer, that a dollar looks as big as a bed blanket to, and he may take the chances of putting some of that money in his pocket. You want to avoid that, and to get you a competent man and let the expert engineer make you an estimate; tell you exactly the cost to build and maintain this road. When you do that you will have a road system that will be a joy. The State cannot build roads, I do not believe. I investigated the roads in New York, and they are simply graft from

one end to the other. It seems that politics gets into the roads when they are built by the States, and it seems that politics poisons everything it gets into. So, I say, let the county get an engineer that has to keep up his reputation.

Delegate.—You speak of your engineer. If you were to build a railroad you would have to have an engineer. You take our county roads; they are laid off, and if you want to change the roads on my farm I am going to kick. The roads are there. You need a man who is intelligent and knows how to work the road, and employ him to have that money expended and expended rightly. You do not need an engineer. If you were to send an engineer here he would say this road on my farm is not located right. It does not suit me.

Mr. Palmer.—That is just the reason you need an engineer. If you do not have an engineer your roads will run just any way.

Delegate.—How is he going to force me to change that road?

Mr. Palmer.—By law. The Indian came first. The white man has followed the Indian. The roads go up and down the mountains, as you know, just as you have stated. If you live where that road runs over the hill and the grade is hard and bad, if that engineer can change that road, he is the man you want, no matter how much you kick at the time, or what you will do.

Delegate.—The road is already there. I would probably add \$200.00 to fix that rather than have it go some other way.

Delegate.—I am from Bedford County. I do not live in the same section of the county that this gentleman does. The trouble is the people where he lives are so stingy and close if they ever get a dollar in their pockets they do not let it get out. In our section of the county we do not mind pulling the money out. We have built a good road this fall, and we have paid for it ourselves.

Delegate.—I am from Dickson County. We have voted \$250,000 bonds. We have had several elections before we got this to carry, and the people of Dickson County said we could not build a road from Dickson to Charlotte because the hills were too steep; we could not get a grade. A few citizens went down into their pockets and hired an engineer to survey the road, and we went around the hills and got a good road. We built a first class pike. We asked them for an election and it carried with a big majority. This gentleman says, How are you going to keep them from stealing your money? I can answer how to get your roads. Do like I am doing. They laid off the roads and I was disappointed. The road did not pass my house and my neighbor's house. In order to keep the county from beating me I went down into my pocket and built the road. You say you cannot get a road because I do not want it to run through my farm. When a man doesn't want a road through his farm he doesn't need a road. I tell them whenever they come to an obstacle in building these roads, do not pay a man for a solid foot of land. Whenever he doesn't want the road tell him there are plenty of roads in other parts of the county. Whenever a road is not worth the land it runs on that farm is not worthy a road. I bought the land on both sides of my road. This road before

I bought it ran up a hill and down a hill, and the fellow I bought the land from was cutting the trees down. He says you bought this land; they will not bother you. The first thing I did, the very day I bought this land, I cut the trees out, threw the fence out, and the very next day I set my fence back fifty feet on level ground. It ran through the middle of my farm. I bought this land for \$8.33 1-3 per acre. I have refused \$100.00 per acre for my land. This was four years ago. It is not because I have improved the land so much. It is because I have put the road where it belongs. You cannot build a road without land to put it on. I tell you, gentlemen, I am as far from paying a man a cent for land to put his road on as any man in the State of Tennessee. I am a road man. I have voted for roads ever since they have allowed me to vote. I will say more than that—the \$600.00 I have put in the pike, if I never see it, I will consider it money well spent. I feel like I have it back on my own farm, and it is on the other side of town.

Delegate—Why is it that the convicts of Tennessee cannot be available for road building in Tennessee as in Colorado and other States? I want this discussed before this convention. I have always been in favor of those convicts getting out where they can get fresh air. My opinion is that the convicts ought to be building roads.

Mr. Palmer—The convicts that are put on the roads are the three-year convicts. Have a camp out there, fill the camp, put them on the road, put them on their honor and you will get good work out of them. Let the county buy the material, and when you do that you will have no trouble in getting good roads.

Mr. J. E. Kavanaugh—The State of Illinois has just passed a bill to work its convicts on the road. They worked for seven years to pass the convict labor bill. They passed the bill in that State, and, as Mr. Palmer says, they have a highway engineer and an assistant highway engineer. No man in the world can build a road without engineers.

Delegate—I would like to ask one question in regard to low places in roads. In these hilly countries we have low places that the water gets in and it wants to stand. Well, people have become educated to make mud holes, filling these holes with mud, which I believe is not the thing to do. Now, I want your judgment on the matter.

Mr. Palmer—I will tell you what you have got to do. You have got to get the water away from the roads. Water is the greatest enemy the road has. You must raise your road so that there will not be any mud holes. You must have money for maintenance, so that you can send a man in a cart with material that he may repair that road. In France they have a man every ten miles, and his sole occupation is to go along the roads and keep the culverts open. He has his little cart with materials which he carries around and fills it up and keeps it in the proper shape. The road will not be worth anything if you do not maintain it. Forty per cent for building, and 60 per cent is necessary for maintaining it. Out in Knox County they built the finest road I ever saw. They do not maintain it and it has gone into ruts.

Delegate—My experience is, keep the water out of the road and the public travel will take care of the road.

Mr. Palmer—That is correct.

Delegate—I find one trouble in my county—people who have not become educated to this good roads system—in other words, farmers, you know, will clean out their fence corners and will dump the brush into the ditches. Well, now it is an open violation of the law to obstruct the public highway. They will cut down cedar trees along the road, and various kinds of trees will grow and they cut them down and leave the brush. People will come along and take down rail fences when they become rotten and leave the posts lying right along by the side of the road. The thing is we have got to get out of that rut. Let each and every man realize that it takes united effort upon the part of the people. You have got to cooperate and people have got to want a thing before they will ever have it. Now, let us not throw any brush in the ditches, rather let us throw it out as we are passing along.

Chairman—I am certainly gratified to see the interest manifested in the subject of good roads. I hope everybody will catch the inspiration. I think it takes cooperation and going down into the pocket to make a good road. A few years ago they built a road through my farm. I said, "Go through this valuable part of my farm and I will build new fences." Now, they are planning to go east and west through another part of my farm. That is worth about \$100 per acre. I said, "Go right through. I will buy the material and do the fencing and help build the road." I am glad we have men here today willing to cooperate. Whenever you get cooperation you will get good roads.

Delegate—If I understand you right, in opening this discussion you remarked that no road that could be built would resist the deadly destruction of the automobile, and that it was one of the greatest agents in tearing down the good road. If that is the case, it seems to me that the automobile ought to be taxed to keep up the road.

Mr. Palmer—I said at that time that if you put a tax on the automobile to drive them out of your county, you would be doing the same thing if you drove the railroad out of your community, so it is cheaper and better for the prosperity of your county to build a road that will stand the automobile, because they are for the good and prosperity of your county and they have come to stay.

Delegate—The farmer is taxed to keep up this road, the automobile comes along and destroys this road. Why should he not be taxed to keep up the road?

Mr. Palmer—A reasonable tax is all right.

Delegate—I do not want to tax them out of existence, because I want one myself.

Delegate N. F. Boone—I desire to make a motion that it is the sense of this body that we work all convicts on public roads. I would like to see this thing carried to a vote of this meeting. If we want a system of good roads this is the most feasible way of getting them. It is not an experiment. It is better for the convict and it gives a road system that even the old brother from Bedford County will be willing to grant a right of way.

Mr. Palmer—I would suggest that in order to stop competition and controversy that you use the three-year men and try the honor system and put them out there without stripes. Give him an opportunity by working on the road.

RESOLUTION.

The following resolution was read by Mr. N. F. Boone:

Resolved, That it is the sentiment of the Middle Tennessee Farmers' Institute that the State convicts be required to work on our public roads, and that we memorialize the next Legislature to enact a law to that effect for all the three-year convicts.

N. F. BOONE.

J. J. ZUCCARELLI.

Chairman—We would like to have that discussed. We hope that you are not all of the same opinion and that we will hear both sides of it discussed. We will give you all the time you want to discuss it.

Mr. Palmer—I will tell you some little experience I have had with the Legislature. In being with these legislators I have carried them around in my automobile a great deal and I sounded the good roads question—the working of convicts on the roads—and I did not find a single man hardly in the Legislature that was in favor of working the convicts on the public roads.

A three-year convict is no use to a manufacturer, because by the time they get him taught his time is out, but they do want the five, six and ten-year convict, because he is there all the time.

The resolution offered was adopted and ordered spread upon the minutes.

Delegate—I want to say that this seems to be the most interesting question discussed here today, and I think it ought to be, because the success and progress of everything that has been discussed depends upon this more than anything else, and I am glad it is that way, because we cannot have any of these things we want without good roads. I have had experience with bad roads. I am a rural route carrier, and if you will carry the mail over such roads as I have for a while you will all be advocates of good roads. I am satisfied that every farmer is an advocate of good roads, because we see that we cannot get anything without good roads. Up in Macon County I want to say that there has been the same spirit as in Bedford County, but we have overcome that to some extent.

Delegate—Now, in answer to that question about ruining my farm; I may not be alive ten years, but if we get these roads there they will be there for years to come. While they might hurt me, let them get them, for they will be for the permanent good of the country. They had the same question with the boulevard here, but they overcame that and they got the boulevard. There are many things I would like to answer that were spoken of, but it seems that many are getting impatient. One other thing I would like to say—these farmers are the very people to get after these things. The farmer has more influence with the man who makes our law than anybody else. What did they do about the rural free delivery? When they found the farmer was for it they gave us rural free delivery. When the farmers asked for parcels post we got parcels post. And if we farmers will get after

this question we are going to have good roads, and we are going to have them like we ought to. We have tried different methods. We have had some graft to contend with, too.

Mr. Palmer—If you desire to have more discussion, if the gentlemen will make a motion to give a special hour to this discussion tomorrow.

Delegate—I desire to make the motion that we have a special hour to give this good roads question discussion tomorrow.

Chairman—Your motion is not in order. I don't think that motion is necessary. We can simply request the time for the discussion, and, I think, it will be all right.

Chairman—Before you leave here I want to say this: This Good Roads Magazine, I am ready to believe, is the very best authority on good roads. We have Mr. Kavanaugh here with us. He is taking a great interest in us, and we would be delighted that he be encouraged all that is possible by subscription through him for that paper. So any of you that seem so disposed to subscribe for that paper take it through Mr. Kavanaugh. That is his business here. I think he should be encouraged. I do not think you can get a better magazine.

No further business coming up, the convention was adjourned until 7:30 P. M.

NIGHT SESSION.

The institute was called to order at 7:30 P. M., with Assistant Commissioner of Agriculture Jesse Tomlinson presiding, in the absence of President Gallagher. The attendance was good, and included many ladies in the audience.

Dr. H. H. Shoulders discussed for thirty minutes the importance of health and sanitation on the farm, and showed the danger of the close proximity to the dwelling of cesspools and wells, and also discussed drainage. Dr. Shoulders' address follows:

TRANSMISSION OF TYPHOID FEVER.



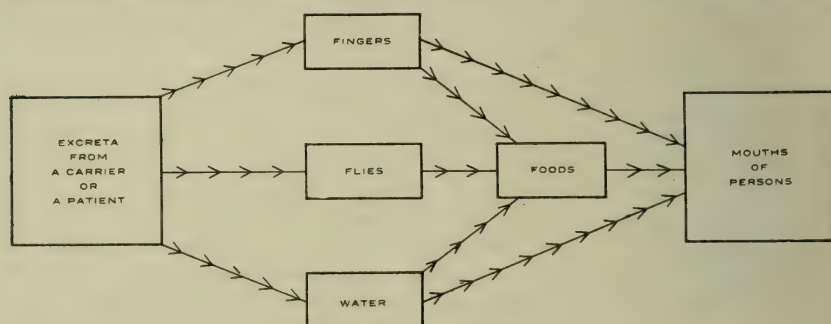
The diagram here shown graphically tells the story of the transmission of typhoid fever. You will please bear in mind that typhoid fever does not occur accidentally, but is transmitted from person to person. The germ which causes the disease is eliminated in the excretions from the body of a person who has, or has had, the disease.

The germs of the disease occur in the excretions of a person during an attack of the disease. They also occur in excretions for months, and occasionally for years after recovery from the attack. The latter are called "typhoid carriers."

The germ must be swallowed before it can produce the disease, so the disease is transmitted from excretions, as represented in a square on left of diagram, to the mouths of persons, as represented in square on the right in the diagram.

There are three paths by which these squares are connected—paths by which typhoid fever is transmitted:

First. A person who cares for a typhoid patient can transmit the germ direct to his own mouth, or to foods, which will enter the "mouths



THE TRANSMISSION OF TYPHOID FEVER

of persons." The housewife who cares for a typhoid patient and, at the same time, prepares food, attends to milk, etc., may convey the germ from the patient to the food, and thence to another person. We often see whole families stricken with typhoid fever transmitted in this way.

Second. When excretions of patients, or "carriers," are disposed of in a way which allows the access of flies, they promptly collect the germs on their feet and deposit them on foods, which enter the "mouths of persons." Thus this circuit is completed.

Third. Water: The excretions from a patient, or "carrier," may be disposed of in a way which allows it to be washed by rainfall into a spring or well, water from which is used for drinking purposes, which enters the "mouths of persons," and thus the third circuit is completed.

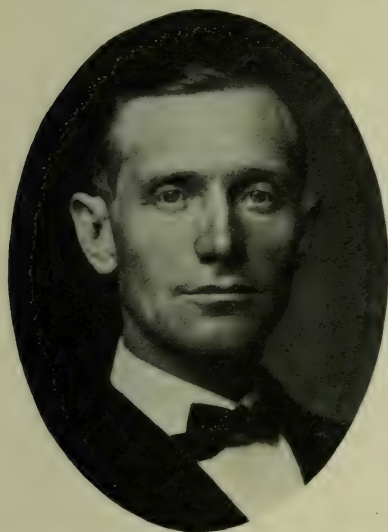
Each of the above paths of transmission can be blocked. Care upon the part of an attendant of a typhoid patient will serve to keep "fingers" clean of germs. Wash the hands thoroughly, and then dip them in an antiseptic solution of carbolic acid or pure alcohol, and, further, don't allow an attendant to a typhoid patient to prepare or handle any foods for well people. A sanitary closet which is screened to prevent the access of flies, and is provided with a water-tight receptacle, which prevents the contamination of soil and water, will block the remaining two avenues of transmission.

These are not fancy theories, but proven facts verified over again. I earnestly hope that you will bear in mind these facts, and become a worker in the cause of disease prevention.

Prof. M. W. Robinson, of the Department of Education, discussed the "Progress in Agricultural Education," and showed the progress farmers have made in the last few years in scientific farming, and the advanced steps that should be yet taken. Prof. Robinson's address follows:

PROGRESS IN AGRICULTURE.

Mr. President, Ladies and Gentlemen:



There is progress in farming. To most of you it might be useless to argue this question, as you are aware of the fact that changes are taking place about you every day. But to many who take little or no interest in agriculture save to *exist*, not to *live*, upon the fruits of the soil, it might be well to call their attention to some improvements upon the farm. They look upon him who seeks new methods as a crank or one who desires to rise above his vocation and make a "book farmer," as they call him.

It is hard for some to believe that anything good can come to the farmer from reading books. I must admit that he has been duped many times and that some have tried to instruct him by their writings who have never worn corns upon their hands by the use of the hoe. Theory is good, practice is good, but both combined, properly executed, is much better. Either is a partial failure without the other.

Many of you have only to call back a few short years and review some changes. You can remember some wooded plot of ground you helped to clear or witnessed cleared. You saw the corn and wheat growing upon its fertile soil and was proud of the amount of grain harvested. You look at it today worn to the clay, even deep gullies and bluffs of rock, fit only for the habitation of the sheep or the goat. Why this? Some man didn't know how to hold his land or keep it from washing away. This is practice without theory.

You have seen other men who read some worthless article that told how a man might raise many bushels of corn to the acre without work. He tried it, and with the result that his land, regardless of how fertile it might have been, produced nothing but weeds. This is theory without practice.

I remember well when a farmer from the north moved into a neighborhood. He bought an old worn-out farm covered with broom-sage, and the neighbors all smiled at the price paid. He knew the soil was capable of retaining all fertilizers placed thereon, and went

had the most fertile farm in the neighborhood. This is theory and practice. Let's combine the two.

You can remember when only one crop of hay was produced each year, and then, later on, we got a crop of hay from the clover field and a seed crop also. Later, some one who knew some science produced another grass, and now we get two, three, four and even five cuttings of alfalfa each year from the same plot of ground.

You can remember when the man who made fifty or sixty bushels of corn per acre went to the village every Saturday to brag about his fine corn and how he made it. Now the school boy makes that much and a hundred bushels more per acre, while his father says: "Son, you can't do it again."

You can remember when you called in all the neighbors to help you kill hogs because you had the largest in the neighborhood. You had one that weighed four hundred pounds, and everybody came to see it. You owned a cow that weighed some twelve hundred pounds that was the talk of the community. You owned a horse that won the races at a two-forty gait. Now you are not satisfied if your hog does not weigh a pound or a pound and a half for each day he is old, and a four hundred pounder is merely the common "run." A hog that weighs eight hundred pounds or a thousand is as common today as four hundred pounds were thirty years ago. The cow, too, has undergone a similar change. A common steer weighs a thousand, while at the State Fair this year you saw more than one that weighed two thousand and one that weighed twenty-five hundred. Two years ago you saw a steer that weighed more than four thousand. You would not show a horse in the ring that would not make a mile in two minutes, and they are gradually pushing time until it will not be long until the mile-a-minute horse will be the slowest considered.

Thus I might continue recounting changes and improvements upon the farm, giving the progress of our vegetables, our grain, our stock, and even our homes, but you are acquainted with these yourself—only look around and see it all.

I must not fail to mention the school-room, as that is an integral part of our farm and home life. The teacher of today must know more than the three R's, or how to work to the "single rule of three." He must know how to make his teaching more than to read and write. The idea of a school of "activities," where all things are taught—mathematics, science, art, language, and the application thereof to real life—farming, sewing, cooking, health and sanitation, even to the making of a home and the care of children.

While there have been many changes and improvements in farming yet real progress is in its infancy. There are many difficulties to overcome yet. May the farmer not only be the leader in his chosen vocation of life, but a leader in the church, and all social life, as he is and ought to be. He is closest to the realities of life, to nature and to his God.

Dr. Lucius P. Brown, State Pure Food and Drugs Inspector, was

to work. By deep culture, fertilizing, and rotation of crops he soon on the program for a discussion of the pure food and drug laws, but delivered instead a very interesting and timely address on eggs and the best method of marketing them. Dr. Brown's address follows:

THE FARMER AND THE EGG AND POULTRY MARKET.



My published subject of tonight is the interpretation of the Food and Drugs Act, but I am not going to talk to you about all the bearings of this act on your business. There is one of them which our latest investigations have shown us to be so much greater in importance than any other that I do not believe that too much can be said on it at this time, and so I am going to talk on the subject which I have just read.

You see a great deal in the newspaper about the importance of Tennessee as a producer of eggs. It is important. It is estimated that the total production of Tennessee in both lines is about \$15,000,000

per annum, but when this is compared with Missouri's production, which is about \$75,000,000 per annum, it dwindles into insignificance. If there be any difference, Missouri is not so well adapted to the raising of poultry as Tennessee. There is no reason except a lack of public interest in this State and the slipshod, haphazard methods of marketing, which prevents Tennessee being as big a producer as Missouri, or any other State of the same size in the Union.

Taking up first the matter of eggs: About \$8,000,000 of the \$15,000,000 annual production of the State is accounted for by eggs. Except for the waste in eggs this ought to be from ten to twelve millions from the stock of poultry which is now producing. Approximately nothing has been done in the State, except by the shippers, to better the quality of the eggs, increase the volume and save the waste. The waste in eggs is caused by improper handling and by the production of fertile eggs in a warm climate.

From June 1 to October 1 of each year about 40 per cent of the egg production is a total loss. This is caused by farmers and other producers allowing their roosters to run with the flocks. As you all know, a good egg will begin to incubate at a temperature of about 68 degrees. If the weather is at summer heat the germ in the fertile egg lives and continues to incubate until a chicken is hatched or else a change in temperature kills the germ and makes a rotten egg, and produces, thereby, a total loss. In either case, from the standpoint of the producer, the egg is gone. The way to remedy this is to kill

or remove every rooster in the flock after the first of June and to keep them separate until the next laying season, and to gather all eggs at least once, and better twice, a day. They should be kept in a cool place and marketed immediately.

The case is different in eggs produced during the last four months of the year, that is from October 1 to January 1; the weather is not so hot then and the eggs are not so liable to hatch, but the egg market is on the upgrade and the farmer and country merchant are tempted to hold their eggs for higher prices. When so held, the egg either spoils altogether or shrinks and acquires a musty or otherwise unpalatable taste. The shrunken egg, that is to say an egg the white of which has become dried and so shrinks leaving a large space, is worth much less than a fresh egg. It is not sold by the shipper as a fresh egg, but is graded by him and sold as a number two or lower. The farmer gains nothing by this, because dealers and shippers, in order to protect themselves, will bid a lower price for these eggs than if they were fresh and marketed promptly. I have heard this difference to farmers estimated as low as five or six cents on the dozen. The result of this is that the farmer or other producer who takes a real interest in his work and raises a good quality of poultry and markets eggs while they are perfectly fresh does not receive the proper benefit from his labors. That is, the prevailing lower prices for eggs at that time makes him help bear the consequence of unsystematic and slipshod methods of the men to whom an egg is an egg and a chicken a chicken.

It is conservatively estimated that the loss to each family in the State of Tennessee from bad eggs is \$5.00 per annum, and if we estimate that only half of the families in Tennessee live on farms, which is probably much less than the proper portion, then each family living on the farm loses \$10.00 per annum, or almost one dollar a month because of these wasteful methods. Ten dollars a year will come pretty near giving one child on the farm shoes and clothing.

The old method of considering eggs as eggs is an injustice to everybody. It has not been changed simply because the producers do not become more intimately acquainted with the marketing end of their produce. If the farmer has a bushel of apples which he wants to sell in the city, and if these apples are bright, free from specks and not decayed, he will ask and receive a better price than if he offered decayed fruit. He can see easily the decayed spots on the apple, test them by the eye, so to speak. But the shell of an egg covers its contents and so the farmer does not pay proper attention to it on that account.

Generally speaking, he does not know when a certain egg was laid, and whether it is fresh or not when offered for sale. But you can be certain that the dealer and shipper knows the difference between eggs. Here is the way they are graded in New York: "Nearby or hennery" eggs are worth about 60 cents a dozen. "Extras," which are full, fresh, clean, extra large eggs are worth from 38 to 40 cents a dozen; extra firsts, the same as extras, but not so large, 35 cents;

firsts, which are about fifty per cent fresh eggs, the balance shrunk, are worth about 28 cents per dozen.

At present dealers in Tennessee are buying eggs to grade first. They cannot reach the higher grades, which as you will see range from 7 to 22 cents more per dozen in price. The reason that Tennessee eggs are not grading higher is that firsts is about the highest Tennessee dealers can obtain, because not enough farmers take sufficient interest in eggs to produce a higher grade, and shippers, therefore, cannot get them in sufficient quantities to ship. It does not pay him to separate all of his seconds and to take the lower price for them, as long as he can put a certain proportion of them in higher grades.

What is the remedy for this enormous loss? The most feasible and obvious remedy is for the farmer or the farmer's wife, whichever looks after the egg business, to produce the highest possible quality of eggs, and they must in marketing these eggs, which are of higher quality, demand a quality price. And, if it be necessary to do so, to candle the eggs at home and to insist that they be candled when they are bought and paid for on that basis.

Practically everything that is necessary to be known about an egg can be found out by the old-fashioned and simple method of candling. Then no dirty eggs must be sold, and thus it is important not only to give the hens clean nests, and to furnish plenty of them so that the hens will not lay out, either in the barn, fence corner or weed patch; and the eggs ought to be marketed at least twice a week in warm weather. Probably most important of all is to kill or sell the roosters after the breeding season, as experiments have shown that an unfertile egg will, at a temperature which will start a fertile egg to hatching in twenty-four hours, last for seventeen days and be eatable at the end of that time. It is believed that there is more loss from this one cause than from any other one, unless it be slack methods of marketing.

This, however, is not all there is to producing a high-grade egg. The foundation ought to be laid properly, and in order to do this you must get rid of the mongrels. I do not believe that there is a farmer here who would deliberately breed to a mongrel cow or horse, and I want to tell you that it will pay just as well to breed to thoroughbred chickens. The best breed for the farmers of Tennessee is one of the larger thoroughbreds, such as Wyandotte, Rhode Island Reds, Orpingtons, Plymouth Rocks, or the like. These chickens will lay an egg of good size and plenty of them. Some farmers believe that the Leghorn will lay more eggs than any other chicken, but this is incorrect. I am not sure, but I believe at present the egg-laying championship of the world lies with the Orpington, and there are lots of two-hundred-egg hens in the Rhode Island Reds and other strains of this sort.

This phase of the question is intimately related to the other matter with which my address is concerned, namely, the production of good poultry. It has been said that the Leghorn hen is the curse of this State, because she will not sell, in outside markets, in competition with the good breeds of other States. Right now live Tennessee poul-

try is selling in New York and other Eastern markets at a cent a pound less than Western poultry and one and a half to two cents less than Indiana poultry, simply because the Tennessee poultry is small and undesirable, and it is almost impossible to dress Tennessee poultry for sale at this time of the year because of its size and condition. Added to this is the fact that Leghorn eggs are small and that you cannot get an extra grade, and it is difficult to get extra firsts. Again, egg producers object to them, because they say that a Leghorn can get over any fence that a hawk can, so that it is practically impossible to confine them.

And so we have two conditions calling for remedy: a production of low-grade eggs and the production of low-grade poultry. The remedy for both is very much the same. Every farmer should raise only thoroughbred poultry of the larger breeds, and preferably of good laying strains. These will lay eggs of good size and color. Then when the farmer takes good care in the gathering and marketing of his products, and insists that his eggs be sold only on a quality basis, he can secure the two to four million dollars per annum for eggs which he now loses, and the production of larger breeds will automatically raise the price of poultry one cent per pound over its present value. And we can get higher prices for our produce of the same class as Western States can, because we are closer to the Eastern market.

I have said nothing before as to the bearing of the Food and Drug Act on the subject, and while it seems a little ungracious to do so at this time, I want to warn you that it is just as much offense against the law for the farmer or farmer's wife to sell as fresh eggs those which are not so as it is for the dealer to do so. Now this department proposes, in the interest of the farmer and the consumer, to do a little missionary work. It is our business, when we find a condition calling for remedy, to use our best efforts to furnish that remedy, whether it be prosecution at law or education. Prosecution is a poor weapon. You can make enemies and very often not attain results. Education is always better.

During the next year we shall from time to time send inspectors of the department on huckster wagons through certain sections of the State, and when these hucksters buy eggs, either from the farmer or from the stores, the department inspector will be on hand and will candle the eggs in the presence of the seller and deliver such instructions as the case may call for. That this policy, persisted in, will do more to secure to the consumer of the State the class of eggs which they should get than any reasonable amount of prosecution is evident, and it ought to add considerably to the farmer's income. The loss on eggs now represents approximately \$1.00 for every man, woman and child in the State, and this sum, instead of being an absolute loss, if it can be distributed among the farmers, will add largely to their comforts and especially to the comfort of their wives and children. And think about how much pleasure it will be to your wife or daughter to handle products of which they may be rightfully proud.

Another thing to which I might call attention, and I wish in do-

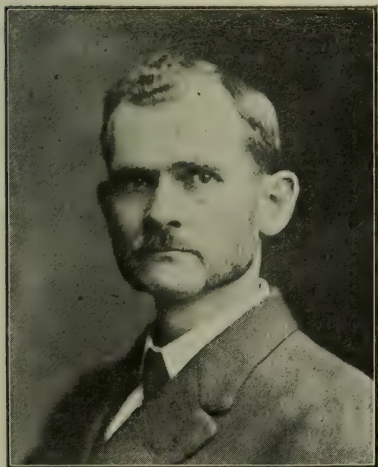
ing so to state that what I shall say is not in any sense a criticism, is the fact that an industry which brings into the State fifteen million dollars per annum is deserving of the closest attention of the State Agricultural Experiment Station and State Department of Agriculture. I know both these institutions so well that I state without hesitation that if they see an interest on the part of farmers in these lines or any desire for action in them, that such action will be gladly taken.

I do not believe most of you know it, but Missouri maintains a State Poultry Experiment Station, and I show you here one of their bulletins. It is called "Swat the Rooster," and it says that he spoils a half million dollars monthly from June to October. In Missouri they have even gone so far that the Governor has said that he would declare June 1 of each year "Rooster Day," and on that day the poultry dealers of the State have agreed to pay as much for roosters as for hens. This means a big direct loss to the dealers, but they figure that it will eventually more than repay them.

The thoughtless man is laughing at this proposition just as he laughs at almost every other suggestion for advance when put forward by "men who know," and the newspapers have apparently gotten considerable mirth out of it. But I want to say to you now that we ought to have a "Rooster Day" in Tennessee and I believe that if the plans of "men who know" are carried out we will have one. I don't know any easier way to save *this* State a half million dollars.

The night session was closed with an interesting lecture on "Bee-Keeping on the Farm," by Dr. J. S. Ward, State Apiarist. Dr. Ward's address follows:

BEE-KEEPING ON THE FARM.



Bee-keeping is one of the side lines in farm life that has been greatly neglected in recent years. A generation ago a few colonies of bees could be found in the yard of nearly every farmer, but at the present time the farmer who keeps bees is the exception and not the rule. This is not as it should be. It is going backward and not forward. It is neglecting one of the most valuable branches of farm life.

Bees have a two-fold value to the farmer: first, when cared for intelligently, they will yield a greater profit on the investment than anything else to which the farmer gives attention. Each colony of bees in a

modern hive will cost about three dollars and fifty cents, and will yield an average of five dollars worth of honey each year thereafter, with an

expense of an occasional painting of the hive and the time given to their care.

Honey flows vary as do other crops. The present year has been exceptionally good, and the Tennessee bee-keepers reaped a big harvest. One bee-keeper, in addition to a very large farm, takes care of one hundred and thirteen colonies of bees, and his gross sales of honey has run to over twelve hundred dollars. His expense has been less than one hundred dollars. There is no side line that will give better profits.

Second. They are of great importance in securing more complete pollination of the flowers of trees and plants. In this way they are invaluable to the fruit growers, truck farmers and the home gardens. An increase in the number of colonies kept in any section of the country will insure the fertilization of the flowers on which the bees work and will result in better crops.

The estimated value of the honey bees in Tennessee each year in honey, beeswax and in the pollination of fruit blooms is placed at over three-quarters of a million dollars. More attention is going to be given to bee-keeping, and the time will come when the annual valuation of the honey bee in Tennessee will run to four or five million dollars. Many will keep bees as a side line, while not a few will follow bee-keeping as a sole occupation. Tennessee, with her mild climate and honey-bearing plants, is an ideal State for bee-keeping, and the future will see thousands of well-kept apiaries scattered over her white clover and alfalfa fields.

The number of colonies that may be profitably kept in one locality depends altogether upon the quantity of honey-producing plants which are growing within two or three miles of the apiary. Where poplar, lynn and locust trees abound in the forest, or where the pastures and roadsides are covered with white or sweet clover, or where alfalfa, alsike clover, crimson clover or buckwheat are grown in abundance, from 100 to 500 colonies may be successfully kept in one apiary.

The light work in bee-keeping makes it an ideal occupation for those unfitted for the more strenuous labor of the farm. The lifting of the heavy supers during the hive manipulation of a honey flow and at extracting time can be done by a good stout hired man. The rest of the work is light. Many women are proving very successful apiarists.

The best time to start in bee-keeping is in the spring. The bees will then have passed safely through the winter and the purchaser can tell if the colonies are strong and sufficiently supplied with stores

to last until the white clover blooms. If the bees are not flying vigorously on a warm, calm day in March or April, the colony probably does not contain enough bees to insure its success.

Another good way to start in bee-keeping is to purchase new hives and arrange with some bee-keeper to catch a few swarms for you and hive them in your boxes. After they have become well established they may be closed up some night and moved home. Don't start with too many. Four or five is enough for the first year. Read and study your new industry, and the next season you can buy more if you desire.

Buy nothing but the standard hive. Don't try to make them or let any carpenter try to make them. Buy the ten-frame hive with good bottom board and metal cover. Wire all frames and be sure to use full sheets of comb foundation. Don't try to make out on starters. They are unsatisfactory and no economy is found in using them. The beginner should buy shallow comb supers and not the supers for the pound sections. When you have the business well in hand you can try some of the pound sections if you desire.

First of all, however, should the beginner invest in a reliable book on bee-culture, one written by a modern, practical bee-keeper, and this book should be mastered. There are several good text-books on bee-keeping.

The science of bee-keeping has advanced as rapidly as any other branch of farming, and the bee-keeper who does not avail himself of the latest knowledge and methods of managing is working at a disadvantage. There is so much that is fascinating and marvelous about the lives of the industrious little toilers that once a man becomes interested in them he is likely to become an enthusiast on the subject.

The product of a hive in a good season may run anywhere from twenty-five to one hundred and fifty pounds of comb honey, or even more, depending on the locality. If more is produced on the farm than is wanted for home use, it is always readily salable, if of good quality, at prices that pay well for the time and money invested. The usual retail price is from fifteen to twenty-five cents per pound, and those who have an established reputation as producers of fancy honey can easily secure buyers for any surplus. A conservative estimate of the average net profit per colony annually is about \$5.00. But even though there is no surplus produced for market, the fact that honey is, to most persons, the most healthful, appetizing sweet, justifies its more extensive use on the farmer's table.

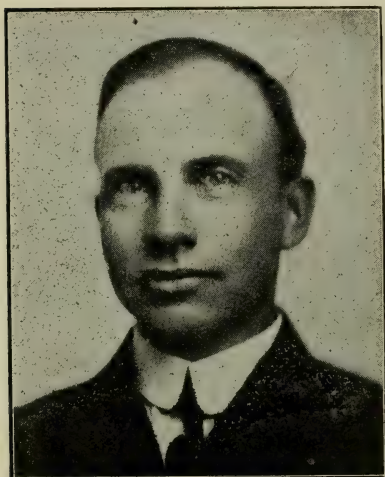
THIRD DAY—THURSDAY, OCTOBER 23, 1913.

MORNING SESSION.

The convention was called to order by President Robert Gallagher, who then introduced Prof. G. M. Bentley, State Entomologist, who made an interesting address on "Practical Methods of Insect Control."

PRACTICAL METHODS OF INSECT CONTROL.

Prof. Bentley's address follows:



MR. CHAIRMAN: The topic we have assigned to us this morning is one that we do not have enough said about at meetings like this. It is a topic that is overlooked. We have been talking about State appropriation, have been talking about rotation of crops, have been talking about seed selection and things of that nature, live stock, etc., for a good many years, but here comes now a topic that should be given due importance, as well as the others.

Since Tennessee is coming to herself as a vegetable and fruit growing State, it is both timely and important that we give consideration

to some unnecessary losses which are coming to us.

Now, I am going, in the few minutes we have at our disposal, to take up these subjects in a simple way. I would much prefer to talk to you men heart to heart than here. I am going to divide this little topic, this topic we have passed over for so many years, and I want you to bear with me, and, by the way, you will not embarrass the talker by asking questions.

Looking over this topic I come to this conclusion, that probably the greatest thing we have to make note of is that these things are in reach. In other words, first realize that these things are here; these things are with us. I refer to the insect ravages, plant disease, etc. When some of you men were young these things were not here, but we have been importing different things from the foreign countries, and with the incoming of those things have come these little folks—these different insects. These things have been quietly working in our midst, and today have become established here. That is the reason you have a board for the control of these things. The little cattle tick is one of our problems. You have had that threshed out and you know today where this State stands. We are above the quarantine line. That is a little factor, yet that was a big factor compared with

some of these other things. Don't say this thought is not practical; some thoughts that do not mean dollars and cents, because these things do.

Why is it over in those States in the Northwest they have a reputation for growing fine apples? Simply because they recognize these things. We can grow them just as good here, just as pretty and just as large. You should have been with me in that little trip around the State and have seen the fruit that the State is producing under the conditions. You should have seen the fruit I saw at that great exposition at Knoxville. You should also have seen our fruit in competition with the other two States at the Tri-State Fair at Memphis.

Now, I want to speak in a very simple and forceful way this morning.

Point No. 1—To review this is to recognize these things. Do not think it is a silly thing and of no importance.

Point No. 2 is this—Beware of frauds. In a certain city of this fair State out comes a man who goes in the very best counties of the State and there he picks out the aggressive young men, and he may get your sons. This man will tell your young men that he has a remedy. This remedy put in trees is going to make them immune to insect pests. He is going among our best counties and picking out our best men, getting those men to represent this stuff, which is a fraud. Do not be taken in by frauds. Do not go to the drug store and try to find some remedy, but consult some one who has your interest at heart and has tried all these things and is willing to help you. I just want to bring this thing home to you. These so-called remedies are expensive, many of them, and of no earthly use. The simpler we can make these things the better they will be.

The very best insecticide that I can give you men of practice, you men who are the very backbone of the nation, the very best remedy I can give you men is good farming. Mark you, I say *good farming*. By good farming I mean clean culture, rotation of crops. Professor Morgan talked to you strongly about this yesterday. I speak of seed selection. That is important. I also speak of fall plowing, winter plowing. Those are really the most far-reaching, the most practical insecticides. These little folks are a very heavy tax. You do not know it, but we do, that for every crop you grow you are paying those little folks 10 per cent.

In McMinn County I went to a corn field, a fine corn field for this year. They said it would produce forty-five or fifty bushels of corn. I went right across the road and took off 100 ears of corn. I did not find one ear of that 100 that did not have that worm that goes down the ear for quite a distance. This year probably that insect will take off about 20 per cent of all the corn we grow. By the way, they are going to put that corn in the crib and the shelled corn in the bin, the winter season will come and these insects are not going to let up and we are going to have weevil. They will work all winter, holidays included. Mark you, men, these things are going on.

Delegate—Do you think that this worm found in the corn will create that weevil?

Prof. Bentley—No, the corn ear worm does not create the weevil.

Delegate—Is the corn with this worm more apt to have the weevil than that without it?

Prof. Bentley—Yes, because the ear is chewed off and the weevil will find this an ideal place to lay the eggs. There are a good many points along this line that I wish we had time to take up, but we will have to hurry. I want to emphasize that these things about good farming are the best things that you can do. You all know the value of fall plowing. You get rid of the grub worm, the cut worm and a good many other things of this kind. You know what clean culture means. We find a good many weeds growing up this time of the year. These weeds have gone to seed. I wish you men would take your knife some Sunday afternoon (mind you, do it Sunday afternoon), cut a few of these weeds and you will find them full of worms. They are a cheap boarding house for worms and bugs. You go into the strawberry patch; take a last year strawberry, cut it open, if you please, and you will find a lot of worms. So the point of clean culture is an important one. Clean out the fence corners; clean out the lanes. People in the cotton growing States, after they have picked the cotton, go over it a second time. That is one of the remedies to clean up boll weevil. The old custom of letting the rag weed stand, letting the weeds go to seed, and the custom of letting the corn stand up all winter is something that you people are paying for, I am paying for, and the city people are paying for heavily.

Clean culture is an important thing to consider in the practical control of insect pests.

Now, on cultivation you have heard Prof. Morgan and different ones talk about plowing deep and subsoiling and all of those things. They are mighty important. But after doing that, which is good farming, you are doing more, you are controlling a good many insects—that cantaloupe and cucumber worm and things like that. You know that worm that bores into the cantaloupe. You have all seen it. The best remedy we know for that is to just simply put a sweep on there and brush under the vines. Just run that right along. That is the best remedy we know for that insect, the commonest of all.

Another thing that I want to speak of is seed selection—seed selection as an insecticide. Seed selection is an important thing. You get seed that are good, seed that are full of vigor and start them and get a good, strong plant. It is the same that the doctors tell us that a strong person is going to be free from disease. It is just the same with tobacco, corn, cotton, etc. Get a strong seed and that plant is going to be less attacked with insects. Mark it, then, that is a practical method.

Rotation of crops—We have heard that so much we will not take it up. It is a threadbare subject. Mark you, after you have rotated from a legume to a grass or something of that nature you have been doing a splendid thing for the control of insects. I know a certain field where they have been growing fine corn for years and years. All kinds of boarding houses have been erected by those insects; cheap boarding houses, up-to-date hotels—Hermitage hotels, Gayoso hotels.

All the insects gather here for the winter. Now, that is no idle thought. It is simply a practical thought, worth thousands of dollars.

We have discussed now three topics, and we have discussed the importance of recognizing these insects. We have discussed the importance of watching out for quack remedies, for proprietary remedies, and we have drawn your attention to consulting the people who know; consult those people who have tried these things. And then the third point we would try to bring home would be the best insecticides, those under good farming.

Now, I want to bring up something about insect pests attacking fruit trees and shade trees. They come from those sources which we mention, and we have got to take some means of controlling them. If we don't do it we might as well cut down our fruit trees and our shade trees. It is just as important to know about these little fellows as it is to know the character of the Shorthorn, the Holstein and the Jersey. It is just as important. I am talking to the man growing six trees back of his house just as much as the man growing 200. But in speaking of those I want to bring this point: I want you to know that these are nearly all easily and cheaply controlled. Let us help you with this. Most of them are insects that can be reached very economically. You tobacco growers, some from Robertson, some from Montgomery, and some from Coffee, you are getting to be quite prominent as tobacco growing counties. That tobacco fly, we will say, has exacted more than 10 per cent from you. The Government is so much interested in that that they have appointed a special man to look after it. You skip over that, you say. Yes, I skip over that, because I realize that meetings like this are no place to bring up matters like that, but I want you to realize that you are paying for special people to do this. If enough people in your community are interested in spraying your trees, let us know that. The railroad is mighty good to us. They let us carry special baggage for these things. We will come right up to your place and talk it over. Other States are doing it, and the people who are getting the best fruit are doing it. Doctors tell us that fruit for children and fruit for all of us is the best medicine we can take, and we believe that. The State is well adapted to these things, and it is just a question of giving the matter some thought and some importance to get results.

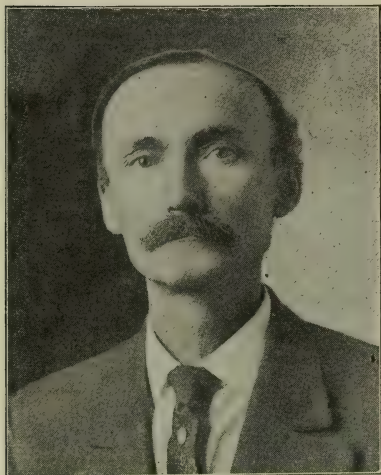
Now, at any time feel free to write us for help. There are about 100 letters coming to the office every day, and you can imagine what an undertaking it is, coming in after being out for several days, but we are glad to have them. We would like to get 200 letters every day. People did not use to know that big, long word entomologist, but now it is beginning to mean dollars and cents. The bankers recognize the meaning of the word. Any time feel free to write for these little points of detail. Address them, State Entomologist at Knoxville, and not at Nashville. You say, why at Knoxville instead of Nashville. Well, it is a State work and we feel that we can do a little more of this by being located at Knoxville, in that locality, than here.

The President introduced Mr. F. W. Gist, Statistical Agent, U. S.

Department of Agriculture, who made an interesting address on "Farm Profits."

Mr. Gist's address follows:

FARM PROFITS.



MR. PRESIDENT AND FARMERS: I am speaking to you today on my own responsibility. I am not commissioned by my department to give you any particular message, nor, in fact, any message at all. At Captain Peck's request I propose to give you the advantage of some observations I have made in personal contact with the farmer and farm conditions in Tennessee, together with a few census facts relating thereto. Some of these are identical with the conclusions of our expert agricultural instructors and some are not.

In the old school days every embryo orator acquired the habit of beginning his remarks with these words: "The subject I am to discuss is one of greatest importance." I am going to go further on this occasion and say that farm profits is the most important subject which the farmer is called on to consider. If I were asked to name the two biggest problems of the farmer, without hesitation I would say, first, to make money; second, to make more money. I do not know any man in Tennessee who is engaged in any business for any other purpose than to make money—do you? That is the primary purpose of all labor, all business effort. Human ambition directs human effort to this end with two things in view—first, to earn a living; second, to provide for the comforts, the joys, the higher attainments which make of life something more than mere living. Farming is no exception to the great rule of human effort, and while others may set up as of first importance many abstract problems, I am here to say to you what each and every one of you know—that your greatest problem is to maintain life, comfort and happiness for yourselves and your families, which means in plain English making enough money out of farming to insure a living and enough more to provide comfort and happiness. Therefore, making the farm profitable and yet more profitable is the one big problem of farming.

Every other subject being discussed today in relation to agriculture is either a means to the end of making more profits or else may be quickly settled and only when farming is more profitable.

I want us to notice some of the so-called problems of the farm and their relation to farm profits, and I think we will find that they all either lead up to my subject or they are dependent upon its solution for theirs.

With something like one-fourth of the rural population of this State

unable to read and write, no one will deny the importance of education as a problem for the farmer to solve. And when we realize that being able to read and write is far from being educated, we are appalled at the density of ignorance in our midst. Someone long ago said that an educated man was one who knows something about everything and everything about something. I prefer to describe the educated man as one whose mind has been trained to think about any subject of interest to him in such manner as to successfully cope with the problems arising from his relations thereto. Therefore, the educated farmer is one who can meet his problems with that clear mental perception necessary to work them out to his advantage. Such a man is always a successful farmer and always makes a profit farming. Education is therefore a very necessary prerequisite to profits on the farm. On the other hand, I say to you in all candor that the percentage of illiteracy referred to above will never be reduced until enough money is made on the farm to send the children to school. There are 600,000 children of school age in Tennessee outside of cities. The total value of all the crops grown in Tennessee is about \$120,000,000. This is \$200 for each child of school age. Let all the men and women and children too young to go to school go without bread and meat and clothes and all the crops grown in Tennessee would not feed and clothe the school children, send them to school and buy their books. I take one of your rural counties at random—White—the county in which my mother was born. There are 5,000 children of school age in that county outside of towns. The value of all crops grown in that county is about \$850,000, or \$170 to each school child. Just ask Prof. Morgan if he will take all the crops in White County and feed and clothe White County's children and give them an education at his school, even with all the aid which it receives from the State and Federal governments. You may talk all you want to about educating the farmers' children, but I tell you that until farmers make more money out of the farm it will never be done.

Some years ago we had a Country Life Commission. I never knew just what they found about the subject, but ever since then we have had many eminent speakers talking about such subjects as "Remaking Country Life," "Beautifying the Farm Home," "Back to the Farm Movement" and so on. Let us see just for a moment how much money the average farmer in Tennessee has with which to improve his home, to beautify his grounds, to do all the things which are being suggested to him by the architects and landscape artists who dream dreams of sylvan dells, murmuring forests and whispering meadows. The 246,000 farms in Tennessee in 1909 produced \$121,000,000 worth of all crops. Add to this about \$65,000,000 for animals, dairy products, poultry and eggs, and we find that the average receipts per farm were about \$750. Will anybody in this audience undertake to tell me how much improvements can be made with what is left of \$750 after the help is paid, the animals fed, the taxes paid, the wives and children fed and clothed? How many young men and women are going back to the farm to do all this on \$750? My good friend, the editor of the *Progressive Farmer*, tells in a recent issue how a waterworks system,

with all the delights of the bath, may be installed on the farm for \$200. The *Progressive Farmer* does its level best to also tell the farmer how to make the extra \$200 out of the farm to do this with. This is more than most of the dreamers of rural beauty undertake to do. I want to say to you that when the Tennessee farmer receives an average of \$1,000 per year instead of \$750 his own pride and love of comfort and pleasant surroundings will lead him to do most of these things, but so long as he makes a bare living the landscape artists, the remakers of homes and country life commissions will sing their songs to ears that are unattuned.

I am in hearty sympathy with the proposition to establish some system of rural credit in this country which will give the farmer who needs credit the use of money at cheaper rates of interest and on easier terms of payment, because such a system will aid the farmer to make more profit out of the farm. The average mortgage debt per farm on those which are mortgaged in Tennessee is \$727, very close to the average value of the products. This in itself shows the necessity for a long-time payment system, and the fact that 35 per cent of the white farmers in Tennessee are tenants shows the necessity for some system which will enable us to build up a community of home owners. And yet, after all, the fact that the tenant usually receives but about one-half the products of his labor, cutting his average to about \$375 per year, is the strongest argument for the need of making owners out of our tenants. Yet when I say that the farmer who makes the profit from farming which it is possible to make needs little or no credit, I am only saying what you good farmers know and what is going to be an important detail confronting the statesmen who undertake to formulate any rural credit system in this country.

Several very able and very sincere gentlemen have been preaching the doctrine of conservation as applied to natural resources, and their sermons have sounded to us very wise. If these gentlemen had been with me over the Cumberland Plateau and seen the timber awaiting shipment, I imagine they would have gotten off the train to preach a sermon right there on the brow of that beautiful range. I find in Cumberland County, at the top of the plateau, 1,198 farms, which produce \$601,000 in crops, animals, dairy products, poultry, eggs, honey and wool and expend \$65,000 for labor, fertilizers and feed, leaving a net average income of \$447 per farm. We can imagine just how much good it would do to stand on the top of that range and recite that beautiful little poem entitled "Woodman, spare that tree," to the man who is confronted with feeding and clothing a wife and five or six children out of \$447.

So, there are many other wise things being presented to the farmer for his consideration, things which would make country life more attractive, more healthful, more desirable; but if they are things which will cost money, they will never impress themselves upon him until he finds the way to make more money. Understand me, I am not decrying the introduction of these subjects nor their discussion. There are many farmers who have already solved this problem of profit. To these let us offer all the suggestions of improvement of their conditions, for

they will appreciate them. But I am suggesting the danger of getting away from the main thing with the average farmer—making more money. It is of the average farmer I speak, and if the average receipts are so low what of the minimum?

What are the net receipts per farm in Tennessee, the net income of the average farmer? Let us see:

Total value of all crops.....	\$121,000,000
Total value of dairy products.....	8,700,000
Total value of poultry and eggs.....	12,200,000
Total value of honey and wax.....	200,000
Total value of wool.....	400,000
Total value of animals sold.....	37,600,000
Total value of animals slaughtered.....	12,200,000

Total gross income.....\$192,300,000

From this must be deducted some fixed charges as follows:

Cost of hired labor.....	\$ 8,400,000
Amount expended for fertilizers.....	1,200,000
Amount expended for feed bought.....	3,600,000
Amount expended for taxes (about).....	9,000,000
Amount expended for interest on mortgage debt.....	1,300,000

Total\$23,500,000

This leaves \$168,800,000 as the total net income from farms in Tennessee. Sounds big, don't it? More than fourteen times the value of the coal mined in the State, twenty-one times the value of all the iron manufactured, twice the value added to raw material by all the manufacturing establishments in the State. And yet let us see. There are 246,000 farms in the State, thus leaving an average net income per farm of about \$686.

Taking from this sum a wage for the farmer only equal to that of the common farm hand, or allowing his own and that wage due his wife and the children who work to go for their meager support, and the cost of feeding his farm animals, the cost of repairs, and all other necessary expenses, the mathematician who undertakes to figure the percentage of profit on the investment in farms and buildings will have to be a better juggler of figures than I am, and I have been considered fairly good.

But perhaps you will say that I am speaking of the shiftless farmer, the extreme cases or the worthless tenants. I am not. I am giving you the cold facts concerning the average. In Johnson County, where there are the highest percentage of farms operated by owners (80), the average net income is \$561, less than the average for the State. In Fayette County, where the highest percentage of tenants exist (80), the average net income per farm is \$523, but little less than that in Johnson. The difference is that the tenant gets but half, or about \$261. I have heard it said that Maury County is the garden spot of

the earth, and from general appearances I believed it until I found that her net income per farm is only \$1,162.

Remember, men, I am no pessimist, nor am I trying to run down your splendid State, because in this respect it is far ahead of some others. But I am trying to impress upon you the fact that you do not make enough money on your farms to make them profitable, to make their life the most desirable, to properly educate your children, to keep them away from the glare of the white lights of the city. Why, even in Maury County, almost double the average for the State, the average receipts are not half what they ought to be. With an average of fifty-nine improved acres to the farm, the receipts there are less than \$20 per acre. If it were \$40 you would still have the problem of profit unsolved.

But I know you are waiting for me to tell you why your farms are not profitable and how to make them so. I shall not do either. Individually each of these questions must be answered by each one of you for himself. All these other speakers are telling you both these things in a general way, for each subject discussed here goes in its final analysis to the question of more profitable farming. They are important to you only as their practical application to your individual case will increase your profits. I am showing you that you are not producing enough to make farming profitable. Let your application of the lessons of soil fertility, conservation of moisture, diversification of interests, better cultural methods, better seed selection, farm management, cattle raising, dairying, cooperative buying and selling, and all that be directed toward the increase of profits. If they do not, they have been given in vain.

Has every farmer present had an income larger than the largest I have named? I hope so. But if you have, a lot of farmers have had less than the smallest. Look around and find them. Help them as these lessons have helped you. Let's see if the next census will not show a net income per farm for the State at least as large as that of Maury County. And that irrespective of any increase in unit prices. If the next ten years do not show a material increase in income, either the farmer or the consumer or both will suffer.

It is true that the total value of all products has increased considerably in the last ten years, but a few more figures will show that the cause of the increase is not the right cause. For instance, the increase in the value of cereals produced in Tennessee was 50 per cent, but the amount of cereals produced, in actual bushels, decreased 3.6 per cent, while the average yield per acre of all cereals decreased 15.7 per cent. Therefore, all the increase in the value of products was due to the increase in price per unit. Unfortunately this matter of price per bushel is something over which the farmer has little or no control, and if the price of corn should go back to 50 cents, wheat to 60 and oats to 30, and all other products in proportion, the net income of the farmer would be \$458 instead of \$686. Therefore, the problem of increasing income is one of increasing production per acre. The Boys' Corn Club and the demonstration farmer have solved that problem by the production of a hundred bushels of corn instead of twenty-

five. Let the colleges of agriculture and experiment stations get busier with carrying the lessons they have learned to the farmer, let the Federal and State departments get busier with their excellent work and reach all the farmers instead of a few, let somebody somehow twist more money out of the Tennessee Legislature for the extension of the practical work of aiding the average farmer. That is your real problem and that is the solution. It is no sacrilege to paraphrase the words of the Good Book and say to you: "Seek ye first the making of more money off the farm, and all these others things will be added unto you."

ANNOUNCEMENTS.

Captain T. P. Peck—GENTLEMEN: Your attention just a minute. I have been asked by the President to make some announcements. I am glad you have given the close attention you have to Mr. Gist's speech. Now, we are going to publish this as well as the other papers of the Institute, and you will get a great deal of additional benefit by reading them. If you will leave us your address, you will get them. We are trying to get through the meeting before we adjourn and avoid an afternoon session. I just want to say the next three papers will deal with how we are going to solve the problems that Mr. Gist has suggested. I want you to follow them closely. I hope you will all agree that this arrangement for holding the Middle Tennessee Farmers' Institute is better than holding it where we have had to heretofore. The Institute is growing and we need larger quarters. We can come to Nashville to see the city at some other time than the Institute, and certainly the farmers of Middle Tennessee can afford to give two and one-half days to studying the problems that are confronting them. We have got to give more individual attention to our own business. The trouble with the farmer, as I said in my address on the first day, he admires what the other fellow is doing to increase his profits, but is indifferent to his own interests. The next two papers will show you how we are going to have the cooperation of a force that is most profitable.

I am asked to request that the Committee on Resolutions meet over in the corner and be ready to report promptly; also the Committee on Nominations.

Now, this is your convention, you understand. I want you to thoroughly understand that the Department of Agriculture is simply assisting in this. We are simply here as your servants, to try to make this as effective as possible.

The Committee on Resolutions is composed of Sam Young, Smith County; John M. Davis, Maury County; C. C. Hedgecothe, Cumberland County; L. P. Bellah, Davidson County; W. S. Leonard, Coffee County.

Mr. Leonard's name has been substituted for Mr. Warden's.

The Committee on Nominations is composed of John Davidson, Lincoln County; T. F. Perkins, Macon County; J. B. Abernathy, Giles County.

Owing to the absence of Mr. M. B. Morton, managing editor of the *Nashville Banner*, his paper, "The Relation of the Press to Agriculture," was read by Mr. A. L. Garrison.

Mr. Garrison—Gentlemen, I have read a part of this paper, and it is simply fine. I just want you to listen to it.

Mr. Morton's address follows:

RELATION OF THE PRESS TO AGRICULTURE.



Born on a farm, reared on a farm, and hoping to end my days on a farm, it is not remarkable that I should take more interest in agricultural pursuits than most men servitude in office work in cities, who have spent long years of penal surrounded by high walls, brick pavements and cobblestones.

Every city dweller of average intelligence realizes the importance of agriculture to the business interests of the world, but few of them have cared to give any further attention to details than to assert that the farmers are a shiftless set and should pay more attention to business methods. They have totally ignored the great battle the farmer must fight and the great problems he must solve; they have failed to realize that up to the past decade he has fought his fight almost single handed.

The last century has seen the most wonderful development along scientific lines in the history of the world. Within that period the steamboat, the iron horse, the electric car, the electric motor as applied in a thousand ways, the electric light, the telephone, the phonograph, the flying machine and wireless telegraphy have come; and yet science, excepting a few mechanical devices, has passed by the most important pursuit of man, the source of all life, the source of all wealth, the source of all prosperity on the earth—the tillage of the soil and occupations related directly thereto.

It is only within the memory of children not yet out of their teens that science has deigned to take a glance at agriculture; that the greatest and most luminous brains have begun to work along a new line that promises the greatest beneficence to man since his creation.

A grand new field has been opened—a new avenue for the employment of active brains. No longer can a farmer be an ignoramus. Hereafter the strongest and brightest mind must run the farm, the "clodhopper" must go to the city where a living may be made with a

smaller expenditure of brain power. The place now for the real scientist is in a new field, where heretofore the surface has hardly been scratched and where the opportunities for discovery and achievement are limitless.

There are men before me today, younger than I, who can remember how a few years ago when a little coterie of progressive farmers, among them my father, met in St. Louis, Mo., in the first Farmers' Congress held in the United States and suggested that the agricultural interests of this country were of sufficient importance to demand the creation of a new Cabinet portfolio—that of Agriculture—they were met with jeers and ridicule. And yet today the suggestion that this Cabinet position be abolished would stamp insanity upon the individual favoring such action.

The farmer, the tiller of the soil, is coming to his own at last, for it is now recognized that no dullard can succeed in this line of business. The telephone, the automobile, but, greatest of all, the rural free delivery that brings the daily mail have come to him. The isolation of farm life is rapidly becoming an unpleasant memory.

And this brings us to the relation between the farmer and the daily press. The farmer is able to receive at his door the news of the world every day. The daily paper, which formerly confined its circulation to the cities and towns, has a new field opened along thousands of miles of rural routes. With the accession of such a large new clientele it has become necessary for the daily press to grow and broaden out. It has long paid much attention to the business interests of the great commercial centers and now it becomes necessary for it to devote time and space and energy to the business interests of the farmer. Most daily papers realize this fact, as Capt. Peck, your Commissioner of Agriculture, well knows. He can tell you how anxious all the dailies are to get every scrap of advanced information that is of interest in a business way to the farmer. He can further tell those of you who have not yet subscribed to a daily paper that the farmers are reading these articles in the press.

A short time ago the farmer was forced to depend on a few poorly edited agricultural papers for information as to agricultural topics; now the agricultural papers have taken on a new life; they are more numerous and better than ever before; and there is hardly a daily paper of consequence in the United States that does not have a department devoted to agriculture and that does not, besides, publish every item of interest that can be secured from thousands of bulletins sent out by national and State departments of agriculture, from agricultural colleges and from experiment stations and demonstration farms in every section of the country. Thus the farmer is being kept posted as to what others are doing and discovering in his line of business and is keeping in touch with the wonderful advancement being made along scientific lines.

I hope I will not be accused of attempting a little cheap adver-

tising when I say that the daily paper by which I am employed has the largest circulation among farmers of any daily paper in Tennessee, and perhaps in the entire South, and this is no doubt largely because of the great attention paid by this paper to agricultural interests.

This shows that the farmers themselves are awake and are keeping step in the march of progress; and there are other signs even more convincing. Witness the great number of farmers who are attending the agricultural institutes, the short courses in agriculture, and who are studying their business with the aid of the new lights science is throwing upon it. It is a gratifying sign to observe from personal contact how much even the old farmers have learned about agronomy and chemistry, and that the time is at hand when it will no longer be necessary to learn by a tedious and costly series of experiments what fertilizer this or that crop or this or that soil requires; and when this great waste is cut off a wonderful step forward will be taken.

The people of this nation are just now awakening to the importance of the education of their boys in the agricultural colleges and the colleges are beginning to receive the assistance from the State that they require. And right here it is not amiss to call attention to the fact that one of the leading, practical scientists of this or any other country, Prof. H. A. Morgan, is at the head of the College of Agriculture of the University of Tennessee. He has done and is doing a great work for Tennessee. He is not yet fully appreciated, but he, too, is coming to his own and one day his name will stand by that of Knapp as one who has wrought miracles for the Southern farmer.

Pardon a personal digression to show that I have faith in what I say. My boy, born in a town and reared in cities, is now conducting a farm in the Black Belt of Alabama after one year in a university and two years in one of the leading agricultural colleges of the world. His plan is after two years' practical experience on the Alabama farm to return to college and finish his education.

This boy got his inspiration while working as a day laborer on the Tennessee experiment farm at Jackson under the direction of Prof. Morgan. He had become a little run down in health, and, on the advice of his physician, had been taken out of the university, where he was studying engineering, and put on the experimental farm for a year; and when he saw the possibilities he decided to abandon engineering and become a farmer. I will join him and become one of you some day.

And now, in conclusion. Show your boys the possibilities in your business and they will no longer leave the farm, God's fresh air and sunshine, for the musty offices, the smoky atmosphere and killing pace in the great cities.

The President introduced Mr. J. N. McCord, editor of the *Marshall Gazette*, Lewisburg, who made an interesting address on "The Country Newspaper as a Force in the Development of Agriculture."

Mr. McCord's address follows:

"THE COUNTRY NEWSPAPER AS A FORCE IN THE DEVELOPMENT OF AGRICULTURE."

MR. PRESIDENT AND MEMBERS OF THE CONVENTION :



From civilization's dawn to the present day the agriculturist has been the base rock of the foundation upon which the commercial affairs of a nation are builded. caused its rarest and richest flow. The farmer folks of the earth have ers to bloom and shed their fragrance. The honest yeomen have added to nature's wonderful beauty in the garden of man, which a great God gave him. They have builded so well that every avenue of business throughout the civilized world has felt the effect of the success or failure of their every effort. In the beginning the farmer toiled with the crude implements that he

had at hand. He tilled the soil with those things that his instincts directed him to. He labored hard for the substance that he secured from mother earth and counted himself fortunate in the possession of the rough implements and the success of his efforts in those days.

Time rolls on with the farmer just as it does with the man of other affairs, and being a man endowed with a mind that was unclouded and with an ambition to achieve great results and to bring his profession to its loftiest possibilities, the American farmer began casting about for help in the development of the agricultural resources, and at this time in his career the county paper presented its columns of live local news to his inquiring mind and convinced him that he was next-door neighbor to every man in his county.

The county paper, with its weekly visits to the farm house, is serving the great masses of the people today as they were never served before. It reports the success of every live farmer who makes a test of some particular crop and thereby inspires his neighbors in other sections of the county. The farmers are soon discussing this crop, the soil, the season of the year for seeding, and those farmers who chanced to see the item in the county paper soon profit from the experience of farmer No. 1.

The editor of the county paper, if he is a real live one, reads carefully every farm journal that comes to his desk, and few journals fail to make their weekly pilgrimage to his place of business. He garners from their columns the best thoughts and gives them to his readers in condensed form but no less valuable. This work on the part of the editor enables the farmer to get the best possible information with no loss of time and considerable less expense. He should read the farm journals too, but the county paper reaches so many farmers who de-

pend wholly upon its columns for their information that the editor has found it to his readers' interest to clip the gems of thought from the best farm journals of this day and submit them to those who are hungry for information.

The county paper best serves itself when serving the cause of agriculture, and that paper in Tennessee that gives its readers the benefit of the weekly "Talks to Farmers" prepared by Captain Peck, Dr. White and others of the Agricultural Department of Tennessee is becoming the greatest force in the development of our agricultural resources. These letters are carefully prepared with the one idea of doing the greatest good to the greatest number of farmers. They are given to the county papers because these journals go into the homes of farmers who read and digest their contents. If you will pardon me, I will say that these letters have long since become a front-page feature with the Marshall Gazette. We believe in them, and believing that nothing is too good for our farmer friends, we have acquired the custom of placing them where they may be found and read first, because they are full of rich information and are live reading matter as well. If perchance one of these letters fails to get in each week, we are invariably asked to explain their absence. Nothing that has been done of recent years by this department has benefited so many farmers as these letters, and I am proud of the part the county paper is having in this great educational work. Farmers would do well to file each paper containing one of these letters away for use in the future.

The county paper forms a strong force in the development of the interest of the farmers in reporting the sales and market conditions of live stock. It reports the premium list of county and State fairs and directs the farmer where to go in search of the best blood lines in horses, cattle, sheep, and hogs. It reports the sale or purchase of registered live stock and creates an interest in the breeding and development of better stock of all kinds. The paper has had a part in removing the scrub from the farm and has convinced many farmers that it costs no more to produce premium winners than to care for the scrub.

The editor of the county paper fights from one year's end to another for better roads. Nothing can or will go further in the development of our agricultural resources than the improvement of our highways, and the people are being educated to the importance of good roads and what the road means to them through the county press, and when Tennessee is a perfect network of splendid highways, as it is sure to be, I hope you will not underestimate the value of services rendered by your county papers. The fight for better roads is young in Tennessee, but some counties are already at work on their construc-

tion, and in every case you will find that the editor of your county paper kept the need of road improvement before the public until the people were ready for action, and it is largely through this avenue that Tennessee will eventually get good roads.

The county paper wields a potent influence in the educational affairs of its section. It supports your every endeavor to improve the condition of rural life and to secure better educational advantages for your children. It helps to make country life attractive and is enthusiastic over the back-to-the-farm movement. It supports you in your fight for the protection of your boys and girls, and preaches the doctrine of good morals and polished manners in its every issue. It is abreast of the times and comes to you free from any influence that strangles the prosperity of the farmer. It is in a continuous fight for those things which will be of benefit to you.

There is yet another avenue of value that the county paper affords the farmer, and that is in the presentation of its advertising columns, where it informs him of the superior points in farm machinery and where such machinery may be bought most advantageously. Not only farming implements but every article of furniture and wearing apparel that your family uses.

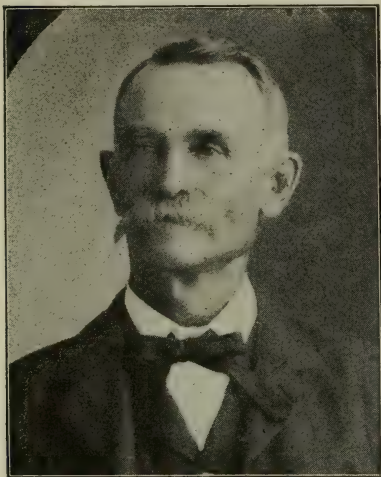
To sum up, the county paper is a force in the development of our agricultural resources because it furnishes an avenue through which the farmer may exploit his success in any line of work, thereby giving his neighbor the benefit of his experience. It makes every citizen of the State your neighbor and friend. It reports the success of the poultry department of the farm and creates a rivalry between the women of the different communities and causes renewed efforts on the part of the housewife to increase the revenues from this source, and the paper, in this way, has been the means of starting many bank accounts that have had their part in the removing of mortgages and creating happy and prosperous homes. It tells the farmers what crops are adapted to certain soils. In fact, the county paper is the most versatile medium that visits the home, and as a consequence is the greatest force in the world today in the development of our agricultural resources.

I am glad to have been permitted to come in this presence. You have honored me with your patience and attention. You are a people blest of God. You live in thousands and thousands of acres of space attuned with melody and in perfect accord with everything that is good and pure. It is great to come here and to receive the welcome that beams from your faces and to note how becomingly nature has crowned woman a queen of radiant beauty in this land where knight-hood is still in flower. I thank you.

THE SILO ON THE FARM.

Mr. J. N. Meroney made an interesting address on "The Silo on the Farm."

Mr. Meroney's address follows:



GENTLEMEN: I come to you at the last of our meeting with a subject that has importance attached to it, following the talk that Mr. Gist has given us to show you that we must make more profit on our farms. I come to talk to you about cattle growing and the use of the silo on the farm as a means for producing more of that profit on the farm. There is no question about it, we have got to produce more per acre on our farms if we feed our constantly increasing population, if we educate our children, if we give our families the necessary pleasures of life. We must make more on our farms. I was

deeply impressed with the figures that Mr. Gist has given us, and I know that you are. I know that you see the necessity for this greatly increased production on our farms. The Boys' Corn Clubs have certainly demonstrated the possibility of increasing our production.

Our Departments of Agriculture, both United States and State, have been doing all they could to disseminate agricultural information among our people, and I am glad to say that I see all over the State its good effect already. It is just beginning to grow, it is doing good, and it is going to do more good.

We are peculiarly favored in our Southland by nature for improved agriculture. We have long growing seasons; we have short, mild winters. We have a chance to grow two crops from our soil. We are peculiarly suited for the growing of cattle and live stock on our farms. We have here in the Middle Basin an eternal coating of blue grass. We have on our Highland Rim a soil that is very strongly impregnated with potash that is highly suitable to vegetable cultivation. We have all of these advantages that we hardly appreciate yet, advantages that our northern neighbors do not have. Now, we must appreciate these advantages. We must put them into practice.

There is a necessity for a change in our mode of cultivation. Our grandparents and our fathers had a virgin soil here to work on. They have by their careless methods of farming exhausted a great part of that soil. Now, it is our part to build it up. We can do this, we must do it, and as a first principle in that improvement we must go to growing more live stock on the farm.

Our population is increasing by millions yearly, our agricultural lands have almost reached their acreage, we cannot spread out any more

agricultural lands, so we must grow more per acre. We must concentrate our efforts in that direction, and it becomes necessary to improve our soil by the feeding of live stock on our farms. It can be done in no other way. No agricultural country in the world can build up its soil, can retain its fertility without the growing of live stock.

There will never be a time when the growing of live stock will be a loss. Our increasing population must be fed; that meat and bread must be grown on the farm. In doing this, by growing this live stock and keeping up the fertility of our land we are in a condition to feed our constantly increasing population.

Now, this brings us directly to the use of the silo as an economical feed for farm live stock. There is no question about the economical use of silage on the farm. It is no longer an experiment. I speak myself from an experience of twenty years in feeding silage to farm stock, and I know what I am talking about.

The silo has come to stay. It should be on every farm in our State, whether it is a large farm or a small farm. Fortunately, a silo is within the reach of every farmer, be he a large farmer, or a small farmer, be he a rich man or a poor man. Silos can be built of various materials, stone, brick, wood, concrete, and a wide range in the cost of construction.

The man who is able to put up a fine concrete silo, \$300.00, \$400.00 or \$500.00, or the man who is able to build a patent factory silo, let him go and build it, but I come to you with a message of economy to the common farmer, to the small farmer. I want you to enjoy the benefits of silage just as well as your rich neighbor. I do not condemn the men for building expensive silos wherever they are able to do so, but this message is to reach the small farmer, the man who needs to make every dollar count 100 cents. He needs the benefits of silage more than his neighbor. It is to you I come with this message, urging you to build your silo on the farm and use it freely in feeding any kind of live stock, and you will never regret it.

If you could make an investment that would pay you 100 per cent yearly, would you not consider that a good investment? Our bankers would. Why not you? If you can build a silo and feed it out in one winter and let it pay for itself, is not that a good investment? It will do it. It is a fixed fact.

Now, corn is our great feeding crop in the South, and yet we farmers have been accustomed to growing it in the fall and letting it stand there and dry out and go and gather the corn and let the shucks and leaves and stalks decay and do us no good. We cannot afford to throw away more than half of our labor, which we do when we use only the grain part of the corn crop. We can put that whole crop into a silo. Nothing but the roots is lost. We put in the stalk, the shuck, the stem; everything is saved. It is fed through the winter.

Winter feeding of silage and summer pasture is the solution of that problem that will add more profit to the farm and more pleasure to the farmer and his family. Now, gentlemen, combine these two. Raise more live stock on your farm, cultivate less of your land and keep that land down in grass and clover. Build it up. Use all the

manure you possibly can. It is worth dollars to you. Cultivate less land and do it better. Our Boys' Corn Clubs show what can be done. We have a boy in our county that makes 169.4 bushels of corn on one acre. This shows that we are neglectful; that we are not getting what comes to us from our soil. It is now a burning necessity that we shall produce more per acre.

Now, as I said, some men have been held back and kept from building silos because of the imaginary cost of the building of them. Now, I have come to you to show you how you can build your own silo on your farm, build it cheaply and build it in such a way that in one winter of feeding twenty head of live stock the silo will pay for itself, and then you will have it for twenty years to come. I have a silo, the first round-stave silo ever built in Tennessee, built twenty-one years ago. It has been filled twenty years and has always given satisfaction, and I give you my opinion that it has paid for itself each one of those years. It has now its twenty-first filling, put in last week.

Now, do not dread the cost of building your silo, for it is within the reach of all of you. Build your fine silos if you are able; build your concrete silos, but they are no better than the wood ones toward keeping the silage.

I want to tell you how to build your own cheap silo yourself, at an expenditure any of you can afford. It has been considered that our northern neighbors are better farmers than we are. They take more advantage of the discoveries of science. They have been going ahead of us. Now, I have here an authentic record of thirty-seven silos built last year in one town, one civil district, one county in the State of Illinois. Why should we allow these people to get so far ahead of us? Haven't we the brains? Haven't we the energy? We know we have. Thirty-seven silos built in one civil district in Illinois in one year; 295 silos built in the State last year. That is for growing cattle, for feeding cattle and beef cattle and dairy cattle. Now, these are facts.

Now, we come to the plan of building a cheap silo. This is a little cut that you perhaps can understand. This is a little pen sketch of my old silo at home. (Exhibits diagram.) It goes down in the ground eight feet. It is twelve feet in diameter. It has a wooden top, setting above on an earthen cistern sixteen feet, making it twenty-four feet from top to bottom and twelve feet in diameter. It holds fifty-five tons, sufficient food for twenty head of cattle for five months. That silage cost to put it in there, turn it up and pack it in \$1.50 a ton. You can fill your silo, grow your crop, pack it in there, counting the cost of your silo, the cost of growing your crop, the cost of packing it in there; you can do the whole thing for about \$2.50 a ton, less than 12½ cents for 100 pounds of good feed, counting the cost of your silo, the cost of growing your crop and the cost of putting it in your silo. Now, that is the cheapest feed you can possibly get for farm stock. You can grow beef and make good money by the use of the summer pasture and winter silage. We have one man in our county that three years ago bought thirty red steer calves, weighing perhaps 300 pounds. He pastured them the first summer; he wintered them the first winter on cheap feed; the second summer he had his pastures better; the third

winter he wintered them on cheap feed again. He built him a splendid silo and filled it the third summer. Last winter he finished out that thirty head of beef cattle and made choice beef of them by the use of the silo. He began feeding in October. He crushed up some corn in addition to the rich corn silage, and he finished these cattle and finished them up as first-class beef and they brought him \$96 around; some of them more than \$100, but they averaged \$96, and those cattle had advanced the value of his farm. He had before that been growing corn and wheat, hauling it to the depot and reducing the value of his farm every year and getting more money and increasing the fertility of his farm. You can do this. Our land belongs to the future generations. We must do it. I am seventy-one years old. I have had the use of that land while I lived; don't expect to use it much longer. Neither can you yours. We must build it up for the future. We can do that by raising cattle on our land, cultivating less land and doing it better.

Delegate—Is that silo concrete?

Mr. Meroney—This is just common 2x4 studding, set up by a big tub. The first cistern is dug in the ground wherever the soil will allow this. Of course, there are some soils where water will rise, but wherever you can have a cellar you can go down in the ground eight feet. You can then build this large tub around this cistern. This little ring that you see around here is a border of brick laid around the top of the silo. Just lay your border about three feet high to keep the wood off the dirt. Set the wood on that little border of brick and let the wood come up above this and extend below. Cement about two feet to keep out the surface water. The joint where the wall rests on this brick is covered with mortar. This wooden tub is made air-tight by drawing it together with iron hoops. The water in my country never rises. There are some sections where it would rise, and in that case it is best to build entirely above the ground or cement it like a cistern. A great deal of Middle Tennessee will bear going down into the ground. That is only for the sake of economy. It is just a little cheaper. I am giving you the cheapest plan by which a silo can be built. You can go entirely above the ground. You can get those studding fourteen, sixteen or twenty feet long and just set them up as a big tub.

Now, if the silo is twelve feet in diameter, each one of these iron hoops that hold it together will consist of three sections of iron 13½ feet long, connected together by iron lugs. The hoop would go through from this side with a nut on that end and go through the opposite side with a nut on that end. You can make it perfectly air-tight. It is within the reach of every man to build his silo. I put mine up in one day and a half with one farm hand to help me. You can get these little iron lugs that connect the hoops together. You can get them as tight as you want them. Now, these studding you see here are put together edgeways, just like a big barrel, and when they are drawn together they are made perfectly air-tight. That is a necessity for silage keeping.

When your silo is built, after it is drawn together tight, after it is fastened up, drawn together close, then you are ready to cut out your door, cut out as many doors as you care to. First, before cutting out

those doors (I want to make this as plain as I can, so you can build your own silo if you want to), before cutting out those doors mark them out, after you have finished the silo and have it fastened up air-tight. Fasten on these doors a batten on the outside. The most convenient is to just take an old wagon tire and have it bent the right proportion to that circle and have holes put in it so that you can use a carriage bolt. Bolt the batten on the outside and before you cut the door out. The object is always to keep the door in proper shape. After you have bolted the batten saw the door out, saw it out with a bevel, making it larger on the inside. In filling that silo you put the door to its place from the inside, the silage holds it there, makes it air-tight.

Now, this is within reach of any of you. And then in filling it I want to show you what we fill it with. It is best to use some kind of prolific corn, something that produces as many ears as possible, a white, long stalk. Put that in the silo at its best stage for feeding. This is all cut up. It is full of rich sap. Everything is at its best point for feeding. Cut it up fine and pack it in closely.

Delegate—At what stage do you put it in?

Mr. Meroney—When it is too hard for table use. When the shucks are getting yellow.

Delegate—What type of corn?

Mr. Meroney—This is the Albemarle Prolific.

Delegate—What forms would you recommend?

Mr. Meroney—I would recommend a round silo always.

Delegate—I mean what form for a cement silo.

Mr. Meroney—I have not had any experience in that. I believe a sheet iron form can be used successfully. I have no experience in that connection. I do not like to talk when I do not know.

Mr. N. F. Boone—Mr. Chairman: If the gentleman will permit me, I would like to tell my experience very briefly. I bought one of these stave silos and carried it home. On my way I met several men who said it had already been tried out and had proven a failure. I took it on, however, and put it up. I did not go down eight feet. Instead of that brick business I simply dug a little trench out and set it up. We got it up in two days. I did not use any cover, following the advice of Jos. E. Wing. I used sorghum to fill it. I thought I would use something I had on hand. I had several cattle that had been eating snowballs during the winter and they were not fat. Very well, by the time the coldest weather came on I went down there and took a look at it. A little of the top had spoiled, but, gentlemen, very little of it. The rest of it was as good as any German sauerkraut you ever saw. Later on I went to see my cattle. They fattened on it. They had that satisfied look and stuck out on the sides. The whole gang in our neighborhood are going to put up silos. Forty per cent, according to the high-brows, is in waste that we throw out. That is a fact. I believe that 40 per cent of it is in the value of that feed. If it is so, you have enough waste on your farms to build your schoolhouses and your churches. Some of you never were in one, I guess, but it is a live problem. Now, that country paper business is all right. If you have a country paper it is a good thing, push it on. But I am going

to ask you men not to neglect the young boys and girls. It will beat the country paper game, all right. I want to say if Tennessee is going to get out of a rut you folks ought to go home and put up a silo and save that 40 per cent and put it in good roads and schoolhouses. That is a saving that can be done. I have proven it, and have proven it against many of these old bald-headed fellows. Don't get discouraged. Just go ahead and make your silo. You need not even put a top on it. I thought all of mine was ruined, but it will not be ruined very deep. Just let it rain on it.

Delegate—You want seasoned stuff to make them of?

Mr. Meroney—I use 2x4 pine.

Mr. T. F. Perkins—Just one word in behalf of the cement silo. You have your gravel and sand and all in the world you want for bracing is a wire fence inside that concrete. You could not burst it open. You could not blow it up with dynamite. These concrete silos need not be so expensive. You have your sand, gravel and water all right there. You have it all at home.

President Gallagher—I am informed that the men to discuss the other subjects are not here.

COMMITTEE ON RESOLUTIONS.

The report of the Committee on Resolutions was read by J. N. McCord, and, upon motion, was adopted and ordered spread upon the minutes.

The report of the Committee on Resolutions follows:

RESOLUTIONS.

The farmers of Middle Tennessee, assembled in our twelfth annual convention, note with pleasure the awakening over the entire State to the benefits to be derived from the application of improved and scientific methods in agriculture. We construe the large attendance at this Institute and the undivided attention given to the speakers who have addressed us as evidencing an increased interest in better methods of farming, better breeds of live stock and more live stock on the farms, better roads, better schools and that improvement all along the line which will tend to make life on the farm more comfortable and profitable. We in Middle Tennessee are blessed with climate, soil, rainfall and other conditions unexcelled anywhere in the world for farming and stock raising.

We congratulate the people of the State, and especially those interested in agriculture and allied industries, on having at the head of the Department of Agriculture as Commissioner a man so thoroughly qualified for the position as Capt. T. F. Peck. We desire to express it as the undivided sentiment of this convention that, in his administration of the affairs of his department, he has done much for the advancement of agriculture in Tennessee, in making the farmers realize the advantages to them of adopting new and progressive ideas and methods in their vocation, and we heartily indorse his administration of its affairs,

and congratulate Gov. Hooper on reappointing him for a second term.

This splendid work of the Department of Agriculture has been done with limited appropriations to the Department, many legislators either not realizing or refusing to recognize or admit the need of expending money for the development of the agricultural interests of the State. One-third of the gross revenues of the State is appropriated for the extension and development of the public school system of the State, and as we realize the importance of education for the masses of the people we endorse this large expenditure of money for this purpose. But we insist that some recognition should be given agriculture, that industry which is the basis of the prosperity and happiness of all the people. Therefore, be it

Resolved, That we here go on record as favoring the election to the next General Assembly of Senators and Representatives who will favor liberal appropriations to the Department of Agriculture for the development and extension of this great industry. We favor the appropriation by the General Assembly of all the revenues collected by the Department of Agriculture to be expended in the interest of the farmers of the State. This revenue comes from the farmers and it should be expended in their interest. And especially do we indorse a continuance of the Institute work so well conducted by the Department of Agriculture. And we also heartily indorse the proposal of Commissioner Peck to establish county demonstration farms in those counties in the State willing to cooperate with the Department of Agriculture, on the plan mapped out in the bill introduced in the recent session of the General Assembly, and recommend that at the next session of the Assembly it be enacted into law.

Resolved, That we indorse the work of the Bureau of Immigration, operating under the Department of Agriculture in its efforts to bring into the State desirable immigrants. Our State has room for and will welcome all who come with energy and honest purpose to make good citizens. Valuable work has been done by the Bureau in advertising the resources and advantages of Tennessee, and during the past two years this work has borne good fruit.

Resolved, That we extend greetings and good wishes to the ladies of the Home-Makers' Section of this Institute, and bid them Godspeed in the good work they are endeavoring to do in all that makes for the betterment of the home, the basis of civilization in all countries. We recommend that the next General Assembly make an appropriation to them for the purpose of extending their work.

Resolved, That we urge the continued support of the State to the Tennessee State Fair. The State Fair is an institution belonging to the whole State, and is deserving of liberal support, as it is doing a great work in exhibiting to the people of our State, as well as those from other States, our unparalleled resources and advantages as an agricultural and live stock community.

Resolved, That we, as farmers, realize that one of the greatest advantages, and also one of our greatest needs, is a better system of public highways, that we may have easy and less costly access to the markets with our products. We favor all legislation that will look to



ENCAMPMENT OF FARM BOYS, TENNESSEE STATE FAIR, NASHVILLE, SEPT. 29—OCT. 4, 1913.

and effect the building of good roads in all sections of the State. We appreciate the fact that many counties are solving this question for their people by the issuance of interest-bearing bonds, and that as a result of this we are having established in many sections of the State excellent highways. We also believe in a State-wide campaign in this work, and to this end we urge the creation by the next General Assembly of a highway commission, one of whom shall be a competent civil engineer, and that this commission be furnished with an appropriation to begin this work.

Resolved, That we indorse the action of the recent General Assembly in appropriating \$10,000.00 for the establishment of an anti-hog cholera serum plant, and believe that the money thus expended will result in the next few years in the saving of millions of dollars to the live stock producers of Tennessee.

Resolved, That we indorse and commend the great work done by Dr. George R. White, State Veterinarian of the Department of Agriculture. Since he has had charge of this work in Tennessee he has thorough cooperation with the Bureau of Animal Industry of the United States Department of Agriculture, succeeded in freeing the State of Texas fever tick, and the markets of the world are now open to Tennessee raised cattle. In addition to freeing the State of the Texas fever tick, he has also eradicated sheep scab, which two years ago threatened to paralyze the sheep-raising industry of the State, as well as effectively check the spread of all other contagious animal diseases.

Resolved, That we heartily indorse the administration of the feed and seed laws of the State, and believe that the strict enforcement of these laws by the Department of Agriculture, through the work of Chief Feed and Seed Inspector, A. L. Garrison, and his efficient field force, is of great benefit to the farmers and live stock men of the State, in that it guarantees to the farmer pure seed and to the live stock men unadulterated feeds.

Resolved, That we appreciate the courtesies of the railroads of Middle Tennessee—the Nashville, Chattanooga & St. Louis, the Louisville & Nashville, the Tennessee Central, the Middle Tennessee, the Nashville and Gallatin Interurban, and the Nashville Interurban—in transporting the delegates to this Institute free of charge, and realize that it is their deep interest in the development of agriculture, and in the welfare of the farmer, that prompts them to this kindness. We extend our best wishes to Col. Robert Gates, who has so long taken a deep interest in institute work, and who has long been the efficient representative of the railroads in their part of the institute work in the State.

Resolved, That we also extend our thanks to our President, Hon. Robert Gallagher, for the courteous and impartial manner in which he has presided over our meetings; and also to our Secretary, T. G. Settle, for the faithful report of the proceedings of the last meeting of this Institute. We also extend our thanks to the newspapers of Nashville for their splendid reports of these meetings; to the Trustees of the State Fair for the use of this building as a meeting place, and

to the people of Nashville for our hospitable reception and treatment while in this beautiful city.

Resolved, That, as farmers, and having the best interests of the State at heart, we believe in the enforcement of all laws on the statute books. We hold that nullification of law is anarchy, and that this is not a political question, as no political party has ever dared go before the people declaring against the enforcement of laws. We therefore heartily and unreservedly endorse the action of the General Assembly, in its recent extraordinary session, in placing on the statute books measures looking to the enforcement of laws that have heretofore been nullified in the cities of the State. And we commend the action of Gov. Hooper in calling the Legislature into extra session for this purpose.

C. C. HEDGECOTHE,

Cumberland County.

JOHN M. DAVIS,

Maury County.

W. S. LEONARD,

Marshall County.

ELECTION OF OFFICERS.

Chairman—We will now hear the report of the Committee on Nominations.

Mr. N. F. Boone—I have been asked to read the report. Before I read that report I would like to make a request of this great metropolitan country journal force, that they will take notice of the fact that this organization has gone on record as favoring the working of convicts on public roads. I trust the gentlemen will keep this in mind, and I hope as a personal favor my friend, Mr. Settle, will see that it is published in all county papers.

The report of the Committee on Nominations follows:

To the Middle Tennessee Farmers' Institute, Nashville, Tenn.:

We, your Committee on Nominations, beg leave to report as follows:

We recommend for President, Robert Gallagher.

We recommend for Vice-President, W. W. Oglevie.

We recommend for Secretary, T. G. Settle.

JOHN R. DAVIDSON,

Lincoln County.

J. B. ABERNATHY,

Giles County.

T. F. PERKINS,

Macon County.

The report of the committee was unanimously adopted, and the officers re-elected for the ensuing year.

Chairman—This winds up the business of the Institute. I want to say on behalf of the Department that we have enjoyed the Institute. We believe there has been good done. We believe that it is fortunate

that the change has been made; that it has been beneficial. We have had fewer this year to come to town and let us see nothing of them. We think we have been benefited that way, and next year we hope we will have no trouble with our Institute. Before we adjourn Professor Fewell wants to make some announcements.

ANNOUNCEMENTS.

Professor J. R. Fewell—I want to announce that we are going to have a meeting of the boys at 1 o'clock in this room in order to have a re-election of officers and in order to take up several matters with you. Will not keep you long.

Captain T. F. Peck—I cannot get you Middle Tennessee farmers together but once a year, and now let me urge as a final word to you that you get together in your counties. I would like to see you get together once a week, but get together once a month any way, and get an organization of the farmers. We are ready to do anything we can to help you; we are your servants and we want you to use us. We want to see more cooperation among the farmers. We want to see them get together. You know all other organizations get together. They understand one another. The farmer will trust anybody quicker than he will his own folks. I am a farmer myself. We do not get together; we do not exchange information. Let's get together and swap information; swap experiences. Let the community get together and decide what kind of live stock you are going to have, and when you have something to sell you know the difference in having the buyer coming to you and you having to peddle what you have. If you have a uniform product to sell the buyer will hunt you up. If you go into a community where there is a uniform product you are going to get the best price. We want to help you, but you have got to get together and get a working organization if you get results.

Professor J. R. Fewell read the report of the Boys' Corn Clubs.

No further business coming up the convention was adjourned *sine die*.

PROCEEDINGS OF THE MIDDLE TENNESSEE HOME-MAKERS' ASSOCIATION.

FIRST DAY—TUESDAY, OCTOBER 21.

MORNING SESSION.

The third annual session of the Home-Makers' Section of the Middle Tennessee Farmers' Institute was opened in the Woman's Building of the State Fair Grounds Tuesday morning, October 21, at 11 o'clock, with the President, Mrs. J. Taylor Stratton, in the chair and all the officers present.

Rev. Carey E. Morgan, pastor of the Vine Street Christian Church, read a lesson from Proverbs and made appropriate comments on the chapter, dwelling on the wisdom of the woman who looks well to the ways of her house, closing his remarks with a prayer for God's blessing and guidance on the women assembled and on their homes and the deliberations of the meeting.

Previous to the formal opening of the program the ladies had met with the regular institute to hear Gov. Hooper's welcome address to the Middle Tennessee Farmers' Institute.

Mrs. T. G. Settle, of Nashville, gave the address of welcome. Her address follows:

WELCOME ADDRESS OF MRS. T. G. SETTLE.

Ladies of the Middle Tennessee Home-Makers' Association:



It gives me great pleasure to welcome you to Nashville. As Chairman of the Woman's Board of the Tennessee State Fair, I greet you on behalf of the State Fair Board and on behalf of every woman who was interested in the fair.

Following closely, as it does, upon the fair itself, this meeting is a continuation of the interest and cooperation which enabled us to meet here such a short while ago to view with honest pride the handiwork of Tennessee women, and hear with just and sincere admiration the brilliant addresses they delivered. The varied and beautiful

exhibits that crowded these walls are returned. The music, song and laughter have died away, but the inspiration of that week can never

die. It will live on in the clearer knowledge, the wider vision gained by thousands of Tennessee women.

I am a great believer in home talent and in home products. I want to say to you that my heart will never cease to thrill in memory of the magnificent claim you Tennessee women made to be ranked among the foremost as producers. Perfection was your motto, and it is a motto certain to bring us into our own.

During the week of the fair I looked at the rare paintings and china, and I thought, "This is Beauty." I looked at the wonderful needlework, and I said, "This is Art." I looked at the splendid display of eatables, and I knew that was Science. But when I looked at this room filled with mothers, each carrying in her arms her baby, I said, "This is Love." I knew it was the baby, beyond any doubt, which is our finest product. The baby! The dear, roguish, little baby, with its little arms around our necks and little feet trying so hard to begin life's journey.

Somehow—I don't know why—to me the most pathetic sight in the world is a pair of wornout baby shoes. They bring such poignant memories of tiny forms just learning to try their strength. Such vivid recollections of every mother's happiest time, when her children are absolutely dependent upon her for all their comfort and joy.

In planning the conduct of the Woman's Department, the Better Babies Contest appeared to me the finest thing we could undertake. While all the fine stock was being improved, why not improve our babies? Through cooperation with the Better Babies Bureau of the Woman's Home Companion, this plan was made feasible. I am glad to say that the home-makers of Middle Tennessee fully did their part in contributing \$50.00 to the contest.

As a Home-maker, interested in every phase of our work, I want to say that Davidson County expects to be fully organized into an association immediately following this meeting. Nearly the entire advisory board of the Woman's Department will form the nucleus of this organization. We expect to meet once a month, and will have varied programs—a demonstration one month, a lecture the next, a general round-table discussion the third, a meeting devoted to home nursing with from four to five papers, a meeting devoted to the care of children, etc. You may expect to hear great things of this Home-makers' branch. One of our objects will be to find ways and means for a new Woman's Building for the fair. The social feature will be emphasized at every meeting, for it is only in friendly unity of thought and purpose that we are enabled to accomplish the things which are worth while. We will not forget music and art in our meetings, nor the men folks.

I am a great believer in men, in their power to stand steady and do their work conscientiously and well. I think the least appreciated man in the world is the average married man. I think we who profit by his goodness and labor should endeavor to make his burdens as light as possible in making cheerful, happy homes, with method for the watchword and kindness for the motto.

Every woman's thinking is her husband's barometer. If she is happy and contented, so is he. If she is sullen and unhappy, both are handicapped.

I want to urge you in your home-making work not to stress too much the tools of our trade. Now that newspapers reach so many homes in the remotest rural sections, nearly every woman knows about the fireless cooker, the dustless floor mop, etc. Any intelligent woman is going to supply herself with some of these aids as far as possible, but I believe there are a great many of us who feel like the negro girl who refused to use a vacuum cleaner, saying when she swept she wanted a broom "what was a broom." A broom is good for so many things. It can scare off tramps, shoo the chickens off the porch, and give the baby a ride. Besides, somehow, a man has a natural inborn deference for a woman with a broom in her hands. Then I know one woman who keeps her electric coffee percolator and iron for ornaments. I think a kitchen without a steaming, fragrant coffee pot is sadly lacking. I do not decry these helps to easier homemaking, but in our association we need more stressing of the bigger things in life. We need to emphasize and inculcate unity and breadth of mind among women.

We need to get away from a personal viewpoint. We can take counsel of the men in this respect. We need more charity for one another and less thought for clothes and bargain counters. Very simple, after all—that impersonal viewpoint that spells success in every business. It is so simple that it makes me think of the old colored woman who went to a registration booth in San Francisco and registered for the first time. "Am you shoah dat I'se done all I has to do?" "Quite sure," replied the clerk, "you see it's very simple." "I ought to know dat," said the old woman, "if dem fool men folks been doin' it all dese years, I might a-knowed it wus a pow'ful simple process."

When science and union have enabled us to perfect our homekeeping, we will have more leisure for our families. Homekeeping doesn't mean just a clean house and good meals. Those are essentials, of course, but to make the genuine home atmosphere which breathes of love and kindness, we must have as much joy as possible. We must have music and laughter and flowers to lift our thoughts away from the material things of life; and we must have an exchange of thought and feeling with other minds. The clearinghouse for most of our imaginary worries lies in a free interchange of our ideas with those of other people. The new viewpoint thus gained is a long step toward the breadth and grandeur of what I like to term the "forward vision," whose horizon knows no bounds.

Again I welcome you to Nashville. That your coming will prove a benefit there is no question. May this, our third convention, be the best yet held, and may each woman present feel at its close that the privileges of homemaking are to be more carefully guarded and tended on account of this association.

RESPONSE TO WELCOME ADDRESS.

The response to this cordial welcome was given by Mrs. James Grizzell, of McMinnville. Her talk was brief because she consented to make the response in the absence of Mrs. J. G. Abernathy, of Tracy City, but it was none the less appropriate.

Following this, the President called Mrs. Clara Boone Mason to the chair while she made her annual address.

ADDRESS OF THE PRESIDENT, MRS. J. TAYLOR STRATTON.



For the third time we meet as a home-makers' organization to count the successes and failure of the past and plan for the future. Each year we enter into the work with hope high and courage strong, only to feel at the end that so little has been accomplished that we had planned. This is as it should be, for when we are satisfied with our achievements effort ceases and decay begins.

Our aims this year were high, to reach the women of every Middle Tennessee county and organize at least one club in each. But the farmer cannot harvest a crop of wheat until the field has been made ready; so we cannot hope to have

a perfect organization until we have sent speakers and literature to prepare the field and sow the seed.

Farm women are waking to the need of better training for their great work. Too long we have been content to labor on in the same way day in and day out and finally see our dearest, our best, slip away for the ease of the city just when we need the love and companionship most.

Some there be who think women put all their thought on the work of the house and none on its inmates. This is not always so. Until a woman learns how to really economize in time and strength she has no opportunity to think of the physical, mental or moral welfare of her family.

We, as farmer's wives, must learn that machinery in the house is as necessary as machinery in the field, and then we can show by a renewed interest in outside affairs that such investments are profitable. It is not necessary for me to dwell on the great possibilities and responsibilities of the occupation of wife or mother, but too often we bury the thought of wife in that of mother and let all our care run to the children, when really husband was first and will be last.

Children are not to be despised or neglected, but fitted into the well-rounded life of the farm. The Home-makers' organization with its varied interests should help to bring this about, for we do not pose as housekeepers nor as mothers, but as homemakers, combining the best of all in one. To enlist the interest of all in this movement we sent Mrs. Rose Nipher to the agricultural institutes arranged by Capt. Peck and Col. Tomlinson. No better representative for our work could have been found, for Mrs. Nipher is already well known in the counties as a fluent speaker and a worthy exponent of our cause. In spite of difficulties, she was met by great crowds, and won for our work the enthusiasm of all who heard her. It is true that many formal organizations were not made, but the seed will bear fruit and the harvest will be rich.

For our new year's work we recommend that a vice-president be obtained in every county, through whom announcements can be made and to whom the executive committee can look for help in the field work. We suggest the value of printing in leaflet form the addresses that have been made before the section meetings of the women in this State, so that every member can have a copy for careful home study.

We believe it would be wise and helpful to gather and print in booklet form suggestions on the care and feeding of the school child as is already done for the babies. We feel that a series of articles on simple domestic science would be appreciated by the rural woman. In order that the women of the whole State may be more closely united in this work, we recommend that the three sections unite in having a common advisory committee, consisting of the presidents of the sections and a secretary who shall take charge of the printing and disseminating of all helps to each section as application is made. To this end we suggest that a committee be appointed to confer with Capt. Peck and the officials of the other sections and an organization be perfected if found practicable.

We feel that the year has not been wasted, even though we see so few results. We know that the work of the coming year will be better for the foundation just laid. We feel grateful for what has been done, and thank you all for the hearty cooperation you have given. May it obtain more far-reaching results.

Following the President's address, Miss Mary Arthur, of the Middle Tennessee Normal School at Murfreesboro, gave a paper on food values and selection.

AFTERNOON SESSION.

The afternoon was given over to general discussion of the purpose of the Home-Makers' Association and the spread of the work. Many new women took part, and good ideas were brought out.

Mrs. J. A. Reagan, of Sweetwater, read a letter from the Secretary of the United States Department of Agriculture, and made an inspiring talk for the uplift of the women.

The letter from the Secretary, which is well worthy of consideration, follows:

Ladies, the Department of Agriculture is in receipt of a letter in which the writer said:

"The farm woman has been the most neglected factor in the rural problem, and she has been especially neglected by the National Department of Agriculture."

This letter was written, not by a woman, but by a broad-minded man, so thoroughly in touch with the agricultural and domestic needs of the country that his opinions have great weight.

The Department of Agriculture certainly wishes to render directly to the women of the United States the full aid and service which their important place in agricultural production warrants.

Because we believe that these women themselves are best fitted to tell the department how it can improve its service for them, I respectfully request that you give careful thought to the matter. Then please communicate your ideas to me in the enclosed franked envelope.

Your answers may state your own personal views, or even better, you may first discuss the question with your women neighbors or in your church societies or women's organizations and submit an answer representing the combined opinions of the women of your entire community. You are, of course, at liberty to criticize freely, but I would especially urge that you try to make your suggestions constructive ones that we can at once put into effect. All of your suggestions will be carefully read and considered by government specialists. Many of them will be carried out at once; others as soon as the information sought can be gathered and the necessary machinery for its distribution made ready. Such suggestions as call for revision of existing laws or additional legislation will be referred to the proper committees of the Senate and the House of Representatives.

Answers to this inquiry should reach me not later than November 15, 1913. All answers should be written on one side of the paper only and should be as concise as it is possible to make them.

In order to serve the women of the country the department from time to time will insert in the weekly issue of the news letter to official crop correspondents special paragraphs or special supplement pages of direct interest to women. Yours truly,

D. F. HOUSTON,
Secretary of Agriculture.

Several ladies took part in the discussion following the reading of the letter.

NIGHT SESSION.

The separate program for the night session was an exceedingly interesting one.

Miss Nellie Gee and her sister, of Nashville, opened the meeting with violin and piano music.

Prof. Harry Clark, of the State University at Knoxville, gave his lecture on the literature of childhood.

Mrs. C. O. Browder, of Sweetwater, read one of her original dialect stories, "Sunrise on the Farm," and the session adjourned to Wednesday morning.

SECOND DAY—WEDNESDAY, OCTOBER 22.

MORNING SESSION.

The meeting was opened Wednesday morning by an instructive and entertaining address by Capt. T. F. Peck, Commissioner of Agriculture. The address of Capt. Peck follows:

ADDRESS OF CAPT. T. F. PECK.

Ladies: I value highly this opportunity to talk to the Home-makers of Middle Tennessee. I am very much interested in the development of the agricultural resources of the State, and I know that if we are to make any headway in the work we must content our boys and girls on the farm, and to do so we must improve home life conditions on the farm if we hope to induce them to stay there and make agriculture a vocation.

To the Home-makers of the State we are looking for assistance in this work. I want to see you equipped for the work that you can do best. It was the great possibilities for effective cooperation on the part of the women of Tennessee that caused me to take such an active part in the organization of a Homemakers' section of the Middle Tennessee Farmers' Institute, as well as like organizations in East and West Tennessee.

From the parent organizations in the three grand divisions of the State I hoped to see a county organization in every county, and each county with branch organizations in each community. Then just think, with such organizations, with an opportunity for the community organizations to send delegates to the division institutes each year, then for the division institutes to select their representative to serve as division director on the board for the Woman's Department of the State Fair; then for this Board of Directors to formulate the policy for the Woman's Department, to give an opportunity to the Home-makers of the State to demonstrate what they were doing to improve home life conditions on the farm and in the city and town. Don't you think the opportunity for organization and getting together and demonstrating progress has been good?

I think woman's greatest avenue for good and for elevating the race is in improving home life conditions. I want you to have every opportunity to equip yourselves for this great work. I would not handicap woman in her efforts for an education along broad lines. She moulds the character of the young and she should have every advantage in mental and moral training.

I have said often, and repeat, that no community or state can boast of a higher civilization than the standard of education provided for the women.

Ladies, you have a great work with unlimited possibilities for good. You can control the policies of Tennessee if you never secure the right of suffrage. You now have the power and influence to control the policies of the State government if you wield the influence you possess. To do so, you must have cohesion and well-defined standards. You accomplish most when you avoid duplication. Too many organizations trying in a general way to accomplish the same results minimizes your efforts in results.

When our women concentrate their energy, their intelligence and their tact towards making their homes the most attractive, the most comfortable and the happiest place where their loved ones can gather, they will have done their full share, and those for whom they have provided such a haven will never tire in their devotion to them. Your organization has the greatest possibilities for elevating and ennobling the people of the State. I want to see your organization grow and develop on the broadest lines. The opportunity is yours and I hope and believe you will profit by it in the fullest sense.

There is one mistake too many of us make. We waste our energies trying for unattainable things and things that we are not ready for, and neglect to do the things we can do that would tend to make the things we are now trying to do more within our grasp. It is neglecting the possible things we can do, and striving for the unattainable things, that has made many lives failures in attainments. Many of us fritter away our time and energies on non-essentials, or fads, and absolutely ignore the things we can do that would help materially in making our environments better.

There is a practical common sense side to every problem that confronts us more prolific of good results than all the theorizing that we can indulge in.

I wish I could portray to you two pictures—one that would represent the real home in all its perfection; the other to represent the place styled home, but having few of the essentials for a happy home.

I shall not attempt to portray either, because neither tongue, pen or the artist's brush can faithfully reproduce the picture our minds conceive. The real home is not always found where money is most lavishly spent in providing it. Neither is its opposite confined to the poor. The real home can be found among the poor as well as among the rich. Happiness and contentment depend upon the good sense and good judgment of the homemakers.

Our memories of the home of our childhood are the most lasting. We want our children, when they leave their childhood home, to voice the sentiment of the poet who said:

"Home of our childhood, how affection clings
And hovers round thee with seraph wings,
That hallowed word is ne'er forgot
The purest feelings of the heart
Still cluster round our home."

You are training the homemakers of the future. The kind of

training you give them now will be reflected in the homes they establish. Too many of us are prone to neglect the opportunities we have for real, effective work in our own sphere in our efforts to do something like some one else has successfully accomplished. When we will find that success only comes to those who confine themselves to the work within their grasp and, successfully doing that has placed their feet firmly on the ladder leading to broader and greater attainments.

I do not propose to insult the intelligence of you ladies by undertaking to define to you the specific detail of your work in improving home life conditions in Tennessee. I simply want to assure you that we men have confidence in your ability to find the things to do and the way to do them most effectively. We simply want to give you the assurance that we appreciate your cooperation, and to assure you also that the manhood of Tennessee is now, as in the past, ready to pay true homage and afford protection to the womanhood of our State.

At the close of Capt. Peck's address he was tendered a rising vote of thanks.

Miss Mary Arthur gave the first of her series of Domestic Science demonstrations, using the making of breads and sauces as the foundation of her instructions.

The morning program was closed with a Mother Goose story by Herbert Lyman Tandy, aged three.

AFTERNOON SESSION.

Afternoon session opened at 1 o'clock.

Miss Arthur continued her demonstration till 2 o'clock, after which the regular order was followed.

Mrs. Frank Fuller, the winner of many prizes for her butter, and a successful merchant of her own wares, gave a demonstration of her methods of butter-making, and answered many questions on how she markets her supplies. She was assisted by Mr. Skinner, who furnished the equipment from the Phillips & Buttorff Manufacturing Co. of Nashville.

Mrs. W. S. Bomar of Shelbyville read a paper on Jelly-making and Preserves. Mrs. Bomar's paper follows:

PRESERVING AND JELLY-MAKING.

Having been asked by Mrs. Walker, one of our most enthusiastic workers, to give you a few ideas on preserving and jelly-making, I decided to comply with her request. However, I feel that there are other ladies in our county who are much more competent than I.

In the beginning, I will say that I have no knowledge of domestic science except what I have gathered from experience. This was rather an expensive lesson. I think, though, that I have profited the more by it.

I will first take up jelly-making, as I think in this I am more successful. I always select perfectly sound fruit, cook in plenty of water,

strain through a jelly bag, then let settle for an hour or two. Never use the bottom. Return the juice to the fire, using a measure of juice to a measure of sugar. After it has boiled sufficiently, heat the glasses and strain the jelly through a thin muslin cloth.

In making jelly from fruits with little acid, so hard to congeal, I use lemon juice if I have the lemons; if not, I cook with the fruit a few green grapes.

In making jellies for a display, I secure the fruit in the different stages of ripening, beginning with the green and continuing until it is thoroughly ripe. In making apple jelly, to have the different colors, I peel some of the fruit. This will be clearer. For others I secure the apples with different colored skins and cook with the peeling on. I sometimes change the flavor by placing in the bottom of the glass mint, cherry, geranium or fig leaves and pour the hot syrup on them.

The apples I consider best for jelly making are: Early Harvest, the most palatable; Ben Davis, the most beautiful. I am more successful in making a small quantity at a time.

Preserve making requires harder work than jelly-making. Our mothers would prepare the fruit and let it stand in sugar overnight. Preserves made by this method are usually darker and require longer time for cooking. I cook my fruit in clear water until I can pierce it with a broom straw, then carefully remove the fruit from the juice and the juice from the fire. After it is cold I take enough juice to dissolve the sugar (using as much sugar as fruit), let it come to a boil, skim well, put in the fruit and cook slowly until the syrup is thick. If the fruit is getting broken, lift it out and boil the syrup longer. In making jams, grape butter and so on, I usually use a few apples that cook easily. This takes up the syrup and prevents it from getting strong later on in the season.

For the benefit of the younger ladies, and especially the farmers' wives and daughters, allow me to say: "Do not be too easily discouraged. Think what others have done, I can do." They have burned their fingers, had too much or not enough sugar, boiled the syrup too long, and had numerous other little trials that will make you cross.

You will not be wearing that pleasant smile when John or Jim comes in to dinner, neither will you get much sympathy, for he will think that part of your work is all foolishness.

I address the farmers' wives and daughters. I fully realize their situation, for I was a farmer's daughter and am a farmer's wife now. Pupils of the town school can not conceive of a girl walking from one to two miles through the mud and cold to school, the term lasting only five or six months, the teacher having thirty-five or forty pupils, ranging from the first to the eighth grade; or possibly two teachers will have seventy-five or eighty. The teachers may be thoroughly qualified to instruct them in many ways, but have time for nothing more than the regular school work. We have exceptions, but the majority of farmers' daughters belong to this class.

Something must be done for the advancement of the rural school; then we, too, can have our daughters educated in many lines with the

city girls. Their cakes will be just as artistic, their preserves and jellies just as attractive. Until this is done, their progress will be slow. Some improvement is already being made, but there is yet a vast territory to be covered.

ROUND-TABLE DISCUSSION.

Mrs. J. L. Walker of Wartrace conducted a round-table on "Things I Have Tried." This was a general discussion of easy methods of doing work, ways of saving many things considered useless, and new ways of serving old dishes.

Mrs. Rose Nipher, organizer and lecturer, who traveled to Middle Tennessee institutes with the representatives of the Department of Agriculture, gave an interesting account of her trip:

MRS. ROSE NIPHER'S REPORT.

REPORT OF WORK DONE IN COUNTIES FROM AUGUST 18 TO SEPTEMBER 21, 1913, BY MRS. NIPHER.



To do this work I traveled at least 1,420 miles over all kinds of roads. Meetings were held at the following places:

Waynesboro, Wayne County; Linden, Perry County; Chapel Hill, Marshall County; LaFayette, Macon County; Gainesboro, Jackson County; Celina, Clay County; Byrdstown, Pickett County; Jamestown, Fentress County; Spencer, Van Buren County; Tracy City, Grundy County; Crossville, Cumberland County; Dover, Stewart County; Livingston, Overton County; Woodbury, Cannon County; Willow Grove, on the way from Celina to Byrdstown.

I spoke twenty-nine times, reaching at a conservative estimate 968 women and girls and 1,800 men and boys, making a total of 2,768 people. In interesting the women in the work, I made fully forty personal calls and many telephone calls. Seven hundred handbooks were given out at the various meetings.

A Home-makers' Club was organized at Jamestown; the work taken up by the Art Class at Crossville and by the W. C. T. U. at Woodbury. Committees were appointed at most every place to further the work as seemed best in the community, the women in many of the county seats serving as a fountain head from which would emanate helpful influences to the country women. It was my purpose everywhere to explain the object and working of the Home-makers' Club.

Taking for my subject "The Home," gave me a very broad territory to cover. Not only could I talk on the housekeeping, but on ventilation, sanitation, the care of children, canning and so on, but when time permitted I could even build good roads to the home and to the school and visit the school, too.

My desire was to be helpful in every way. It gave me pleasure to talk about the State Fair and the coming meeting of the Home-makers' Section of the Middle Tennessee Farmers' Institute.

It was indeed a strenuous trip, over many miles of hill and dale and river, by buggy, auto and boat, but the ground was ready for cultivation and some seed was sown that will in the days to come bring forth some fruit for the harvest.

Mrs. Clara Boone Mason closed the afternoon program with an interesting paper.

Mrs. Mason's paper follows:

EVERY WOMAN'S OPPORTUNITY.

Since the subject of home-making has been so thoroughly and ably discussed, I shall vary the program somewhat by telling of present day opportunities along other lines.

Always in this work-a-day world, with its bodies to be clothed, its hunger to be satisfied, there is a tomorrow luring us on with its promise of better things. Never have women been so interested and engaged in the world's work, looking to the future, as at present.

Child labor reform, sex purity, the ballot and many other subjects claim their time and attention, till home-making sometimes seems of secondary importance.

Mrs. Corra Harris says that women are naturally wild and undomesticated, and that her subjection to man only caused her to be the burden bearer of the family for so long. If this be true, it is not strange that freedom of thought and speech have made her a trifle dizzy. She is liable to mistakes and may be over zealous in her new field of endeavor. The critics should be patient, at least until she gets her bearings. We might say with George Eliot, "I'm not denyin' that women are foolish. God made 'em to match the men."

It may be well to frighten the men a bit with some mental gymnastics before settling down to serious, dependable work. Edward Martin spoke truly when he said, "The master women need is not a man, but an inner governor who shall look out of their eyes and see truth and duty and strengthen their hands to seize them." To be thus equipped means success, not only to the individual, but to organized workers as well.

There is another essential sometimes overlooked in women's organizations, and that is a knowledge of parliamentary law. We are prone to criticise and condemn the methods employed by our brothers' assemblies. Now is the time to set an example and improve upon their methods, and above all else, to consider the cause in which we

are united paramount to personal ambition. If the Home-makers of Middle Tennessee can accomplish this, they will have traveled far on the road toward good government and self-government.

The hour has struck for every woman to select her chosen field of work, where she will succeed if equipped and strengthened by the courage of her convictions, though it be city reform or country uplift.

John D. Barry has written for us a creed in the following lines:

"Not to be different, Lord,
 I ask, from those that fare
 Beside me on life's way,
 But that my spirit shall accord
 With their great purpose, that my share
 Wholly I may fulfill, in thought and will;
 And that the simple creed,
 Of all men's right within Thy sight,
 I may affirm by word and deed.
 "O save me from the blame
 Of those who have forgot
 Their brotherhood, and boast
 Of worth ancestral, and feel shame
 For such as bear the common lot.
 Make me, dear God, to see if aught through me
 Find favor in Thy ken,
 'Tis but in part the grace Thy heart
 Pours richly on my fellowmen."

THIRD DAY—THURSDAY, OCTOBER 23.

The last session of the Home-makers was purely a business meeting. The first was the report of the Secretary-Treasurer as follows:

Madam President and Ladies:

Your Secretary has during the past year sent out 120 letters to women in this and other States asking for help along the line of our work. There have also been 500 copies of the revised handbook mailed out.

The Secretary and President revised the handbook of last year and had 5,000 copies printed. Of this number, 1,800 were given to interested women at the State Fair and the Conservation Exposition, 700 were distributed by Mrs. Nipher, and 500 sent from the office, making a total of 3,000 in circulation.

One club was organized by Mrs. Nipher and the work introduced into two existing organizations. This is a good beginning, but we must follow it up.

As your Treasurer, I report the following:

Received at Institute last year as dues and gifts	\$ 12.00
Held in trust by Capt. Peck	250.00
<hr/>	
Total cash received	\$262.00

Paid for Printing	\$ 36.85
To Mrs. Nipher	60.00
For Postage and Stationery	5.00
For Better Babies' Contest	50.00
Total paid out	<u>\$151.85</u>
Balance on hand	\$110.15

The expenses of this meeting will be taken out of this, and there are a few small bills still unpaid, but there will still be money in the treasury when all bills are met. Respectfully submitted.

MYRA A. TANDY, *Secretary-Treasurer.*

One of the most important items of business was the appointment of Vice-Presidents. Only fourteen counties were named, but the Executive Committee, with the aid of Mrs. Nipher, was empowered to appoint the rest. The Vice-Presidents are:

Mrs. M. S. Bomar, Bedford; Mrs. Mary Meek, Maury; Mrs. J. T. Stratton, Davidson; Mrs. H. A. English, Giles; Mrs. Marvin Spence, Lawrence; Mrs. James Grizell, Sr., Warren; Mrs. H. R. Webb, Cumberland; Mrs. S. H. Taylor, Franklin; Mrs. E. R. White, Macon; Mrs. Lewis Wilhoit, White; Mrs. Francis Smith, Rutherford; Mrs. John Epperson, Putnam; Miss Lucile Taylor, Lincoln; Mrs. W. W. Ogilvie, Marshall.

LETTER FROM MRS. M. P. BANG.

During the session, the following letter from Mrs. Mary P. Bang, corresponding secretary of the Tennessee W. C. T. U., to Mrs. Taylor Stratton, President of the Home-makers' Association, was read:

Nashville, Tenn., Oct. 21, 1913.

Mrs. Taylor Stratton, President Home-makers' Section of Farmers' Institute, in Session in Nashville:

Dear Mrs. Stratton—As secretary of the Tennessee Woman's Christian Temperance Union, it is my pleasant duty to convey to your organization greetings and assurances of hearty good will. The following resolution was unanimously adopted by the W. C. T. U. State convention in session yesterday, October 20, in Fayetteville:

"WHEREAS, Our national organization has recognized the Home-makers' Section of the Farmers' Institute and recommended their work; therefore, be it

"*Resolved*, That the State W. C. T. U., now convened, send greetings to the Home-makers assembled in Nashville this week, and recommend our local unions to commend their work and cooperate with their collaborators where such are or will be appointed for the various

counties; also that a copy of this resolution be sent to the Home-makers in convention. This October 21.

Cordially,

MRS. MARY P. BANG, *Cor.-Sec'y.*

The resolutions adopted by the W. C. T. U. were received with thanks by the association.

OFFICERS ELECTED.

Next on the business program was the election of officers for the ensuing year, the following being chosen:

Mrs. Clara Boone Mason, Giles, President; Mrs. J. L. Walker, Bedford, Vice-President; Mrs. W. H. Tandy, Davidson, Secretary and Treasurer; and Mrs. Charles Slack, Davidson; Mrs. Claude Jones, Franklin, Mrs. T. G. Settle, Davidson, members of the Executive Committee. Mrs. Mason was recommended for representative of the Woman's Department of the State Fair Board.

RESOLUTIONS.

The following resolutions were adopted by the association:

"Be It Resolved, First, that the thanks of the Middle Tennessee Home-makers be extended to Commissioner of Agriculture T. F. Peck, the father of the organization, who has not only made such an important body possible, but has at all times manifested an unfailing interest in all deliberations and meetings of its members. We duly appreciate his interest and wish to especially thank him for his helpful and uplifting lecture delivered before our morning meeting of October 22.

"Resolved. Also, that the thanks of the Home-makers be also extended to T. G. Settle, of the Department of Agriculture, for his many courtesies extended the Home-makers.

"Second, that we thank Mesdames Reagan and Browder, of Sweetwater, members of the East Tennessee Home-makers, who by their presence and voice have added much to the success of the meeting.

"Third that we thank Miss Mary Arthur, of the Middle Tennessee Normal College, and her assistant, Miss Smith, for instructive talks and practical culinary demonstrations.

"Fourth, that the appreciation of our organization be extended to Prof. Harry Clark for his inspiring lecture of Tuesday night, and that we also thank Miss Gee for furnishing the music for the evening's entertainment.

"Fifth, that our appreciation is also due Mrs. Fuller for her demonstration in butter-making; Mrs. Bomar for an interesting paper, and Phillips & Buttorff for all equipment used in demonstrations.

"Respectfully submitted,

"MRS. CHAS. W. BAKER,

"MRS. CHAS. H. SLACK,

"MRS. H. A. ENGLISH,

"MRS. L. H. RUCH."

A vote of thanks was extended Mrs. T. G. Settle for her efficient work as chairman of the State Fair Board for the past year, and to the retiring officers of the association for their devoted and untiring work in behalf of the Home-makers' organization. The retiring President, Mrs. Stratton, delivered a farewell address, feelingly expressing her thanks for the fine spirit of cooperation maintained by members of the association, and bespeaking the sentiment of the other retiring officials.

The session was closed with a demonstration in cake-making and icing by Miss Arthur.

This was by far the best attended meeting yet held, not so many coming from Davidson, perhaps, but other counties sending large delegations, who attended the sessions and took some part. It was also the most helpful meeting held, and will no doubt tend to arouse greater interest for next year's session.

MIDDLE TENNESSEE BOYS' CORN CLUB.

GRADING OF CONTESTANTS.

Great interest was taken in the exhibits of the Boys' Corn Clubs, in the building where the institute sessions were held. Owing to the early meeting of the institute this year, the entries were not complete, and with the agreement of those boys who had exhibits, Prof. J. R. Fewell and Mr. H. D. Tate, with Judge Robert Ewing, of the Agricultural Committee of the Board of Trade of Nashville, the final award of prizes was postponed until November 22, in order to give other boys in Middle Tennessee a chance to compete.

On that date the corn exhibit was complete at the Agricultural Building at the Fair Grounds, and the grading of the contestants was announced. The awards were made on four points—yield, 30 per cent; profit, 30 per cent; report, 20 per cent; exhibit, 20 per cent.

The following report submitted by J. R. Fewell, State Corn Club Agent of the United States Department of Agriculture, gives the standing of the boys contesting:

RECORD OF MIDDLE TENNESSEE CORN CLUB BOYS.

Name	County	Yield 30%	Cost per bu.	Profit 30%	Re- port 20%	Ex- hibit 20%	Total Grade
Ernest Thomas, Smith		123.2	\$.13	\$103.74	19	14.	98.
Layman Austell, Franklin		113.5	.73	90.15	19	15.2	91.1
H. Baker, White		118.8	.28	73.91	15	15.8	83.6
C. B. Fain, Montgomery		122.	.13	93.45	7	16.5	83.5
J. Bowden, White		110.7	.51	78.43	15	15.8	82.9
Terry Woodard, Sumner		73.3	.20	45.66	19	18.8	79.3
J. A. Bowden, White		113.8	.14	86.42	7	15.5	78.3
Harry Neal, Giles		83.	.15	62.25	18	15.6	73.8
P. L. Thomas, Lincoln		91.2	.25	58.48	19	15.5	73.6
Geo. Averitt, Houston		83.7	.24	54.58	18	15.9	72.5
W. H. Spivey, Sumner		81.5	.17	59.48	16	17.5	72.1
L. Loftas, Macon		90.	.29	54.25	14	15.2	68.4

RECORD OF MIDDLE TENNESSEE CORN CLUB BOYS—Continued.

Name	County	Yield 30%	Cost per bu.	Profit 30%	Re- port 20%	Ex- hibit 20%	Total Grade
E. T. Weeks, Stewart		69.5	.20	47.71	19	16.8	68.2
McFerrin Wilson, Davidson		72.2	.28	44.48	20	15.8	67.4
J. Shelton, Houston		77.1	.21	53.09	14	15.7	65.4
Roy Verble, White		83.	.35	30.36	18	16.	64.3
G. Park, Giles		66.	.44	30.36	20	18.4	64.
R. Spivey, Sumner		75.6	.19	42.57	16	15.8	63.8
L. Dallas, Macon		69.9	.38	38.67	17	16.	62.7
G. Dallas, Macon		68.5	.38	37.75	17	15.5	61.6
T. Farris, Franklin		59.4	.32	34.56	19	15.8	60.3
J. Neal, Wilson		53.2	.18	36.38	19	16.5	60.1
H. Adkins, Houston		55.	.26	35.10	19	15.9	59.5
J. Mills, Montgomery		80.2	.40	37.58	14	15.2	59.8
Brent Clark, Davidson		51.4	.19	36.39	18	15.7	59.7
B. Huffman, Bedford		47.	.27	29.40	19	18.9	58.8
F. B. Carver, Rutherford		71.2	.36	28.13	19	16.2	58.7
A. D. Spivey, Sumner		50.7	.27	31.85	17	16.	58.6
M. Wright, Sumner		53.8	.34	25.10	15	15.	57.9
L. Payne, Franklin		55.	.24	36.20	17	15.8	57.4
R. Reynolds, Franklin		50.	.22	33.70	19	15.8	57.3
J. F. Denson, Franklin		53.3	.63	14.02	19	18.2	54.7
T. Hunter, Davidson		50.	.30	30.00	17	15.7	54.7
T. Johnson, White		68.9	.21	47.56	7	15.8	54.6
F. Call, Franklin		50.	.17	36.45	16	15.2	54.6
C. W. Price, Wilson		30.7	.79	3.38	19	16.2	54.2
H. Leitsinger, Grundy		52.	.41	25.05	18	15.5	53.9
F. B. Chambers, Giles		42.5	.28	26.25	20	15.2	53.8
H. McKibbin, Maury		91.5	.27	47.98	7	15.8	53.7
Doris Hagan, Giles		44.	.41	22.15	19	16.1	53.1
W. Yarbrough, Franklin		36.3	.34	20.37	19	18.7	52.9
H. Goddard, White		60.	.67	40.40	7	15.4	52.
W. Shelton, Houston		71.2	.24	28.86	7	18.7	50.8
E. Averitt, Houston		60.2	.37	31.93	18	17.7	50.7
J. Nowland, Davidson		45.	.25	28.37	14	15.8	50.6
E. Kennedy, Macon		56.5	.16	41.70	7	16.	50.
C. Grief, Franklin		48.	.58	15.36	18	15.8	50.
C. Parker, Macon		55.5	.15	41.30	7	15.6	49.5
B. Tanksley, Davidson		41.8	.50	16.47	19	15.2	49.5
W. Bransford, Smith		55.	.29	5.50	17	17.6	49.5
L. McDowell, White		64.5	.33	35.80	7	15.3	49.3
Walter Blackman, Rutherford		42.3	.46	18.42	16	16.	50.4
G. R. Bryan, Wilson		36.	.27	22.40	19	15.5	49.1
B. Looney, Franklin		40.4	.53	13.95	19	17.8	49.
G. Stewart, White		45.3	.62	12.72	18	15.8	48.8
J. McCasland, Davidson		32.5	.40	16.25	20	15.5	48.5
B. Vandervoos, Franklin		43.	.53	15.91	17	16.	48.3
J. Lane, Davidson		40.	.21	27.70	14	15.8	48.2
H. Alexander, Macon		50.2	.85	7.05	18	15.6	48.2
T. M. Sliger, Macon		43.5	.53	15.69	17	15.2	47.7
G. Crutcherfield, Davidson		45.4	.85	2.18	20	15.7	47.6
Frank Perkins, Trousdale		35.	.40	13.90	18	15.6	47.1
D. May, Coffee		52.7	.35	28.68	7	17.1	47.1
J. Cunningham, Lincoln		68.7	.70	21.15	7	16.4	46.9
W. Torian, Houston		39.8	.63	13.74	18	15.2	46.9
W. Bracey, Davidson		40.	.34	22.45	14	15.8	46.6
J. Perkins, Trousdale		33.3	.34	18.42	17	15.4	46.5
W. Mason, Franklin		46.2	.73	7.85	17	16.5	46.5
B. Shelton, Coffee		62.5	.21	26.45	7	15.7	46.4
H. Perkins, Trousdale		33.3	.34	17.80	17	15.5	46.2
C. Ufferman, Houston		57.2	.31	33.38	18	15.7	46.1
W. Lane, Davidson		40.	.22	27.34	14	15.8	46.1
Ola Hudson, Lawrence		48.6	.48	20.19	14	15.	46.
H. Looney, Franklin		49.5	.37	26.23	20	15.2	45.6
B. Harvey, Montgomery		61.2	.23	39.38	18	....	45.6
D. Barton, Macon		37.	.76	4.98	17	18.	45.6
B. Garrison, Sumner		36.3	.70	7.30	18	16.7	45.4
J. Schabik, Sumner		24.9	.83	1.74	14	18.8	45.
C. Cullom, Trousdale		25.	.48	10.45	19	15.5	44.6
W. M. Gibbs, Williamson		22.7	.49	9.13	18	15.2	44.4
S. Moyer, Sumner		35.	.58	15.90	18	15.8	44.
J. O. Miller, Franklin		31.7	.73	5.38	19	15.9	43.9
H. Johnson, White		70.6	.25	45.49	7	15.2	43.7
Dillard May, Coffee		51.7	.36	26.43	7	15.5	43.6
E. Tipps, Franklin		35.	.66	8.25	18	14.8	43.5

RECORD OF MIDDLE TENNESSEE CORN CLUBBOYS—Continued.

Name	County	Yield 30%	Corn per bu.	Profit 50%	Re- port 20%	Ex- hibit 20%	Total Grade
R. Barton, Macon		39.8	.44	18.26	7	15.9	43.3
A. Ruck, Franklin		46.	.43	21.18	20	15.2	42.9
G. Williams, Davidson		30.	.30	18.05	14	15.8	42.6
F. Johnson, Giles		32.5	.30	18.40	18	11.	42.5
A. Owen, Macon		25.	.61	7.20	17	17.	42.2
T. J. Patton, Lincoln		27.	...	...	19	15.6	41.2
Sam Dabbs, Stewart		45.	.90	...	16	14.2	41.2
E. Smith, Williamson		54.	.55	18.58	7	15.	40.9
O. Pride, Davidson		52.5	.20	36.50	7	15.5	40.9
W. C. Grief, Franklin		35.	.76	4.90	20	15.8	40.7
C. Johnson, White		55.9	.40	27.95	18	...	40.2
Buell Spencer, Lincoln		22.4	...	...	18	17.2	39.6
C. Donoho, Sumner		20.7	...	...	18	16.	38.
C. Brack, Franklin		38.5	.34	18.20	7	15.7	37.8
R. Wolf, Coffee		51.8	.57	16.70	7	17.8	37.2
B. Blalock, Lincoln		19.8	...	...	14	16.3	35.1
N. Smith, Montgomery		67.5	.36	36.	7	...	34.9
F. Locke, Lawrence		20.	.63	5.35	14	14.5	34.9
B. Lossing, Franklin		34.	...	...	20	15.4	33.7
Will Clark, Houston		37.4	.46	15.60	18	...	32.1
W. B. Jonte, Davidson		28.4	.60	6.26	7	15.3	31.9
A. Lauderdale, Trousdale		40.	.53	14.50	7	15.5	30.6
H. Spencer, Lincoln		39.2	.55	13.58	16	...	29.8
A. Rogers, Houston		32.	.61	9.15	18	...	28.5
H. Holt, Williamson		30.	.44	15.15	16	...	28.2
L. Lockart, Houston		39.5	.61	12.75	14	...	27.6
R. Averitt, Houston		31.8	.70	7.47	17	...	27.1
E. Walker, Houston		26.	.80	4.05	19	...	26.9
O. Harrison, Sumner		25.	...	...	19	...	26.5
F. Fisher, White		44.	.35	24.20	7	...	25.
B. Taylor, Lincoln		43.8	.38	22.04	7	...	24.6
C. Lomax, Houston		25.	.91	...	18	...	24.4
B. Averitt, Houston		26.8	.94	...	17	...	23.6
E. Bateman, Houston		36.	.43	16.65	7	...	21.2
W. C. Dodson, Davidson		45.5	.30	26.72	7	...	20.1
A. Hutchinson, Lincoln		34.9	.48	14.56	7	...	19.7
J. A. Gleason, Davidson		30.	.29	18.25	7	...	19.2
B. Marston, Lawrence		51.	.91	...	14	...	19.
Paul Jones, Franklin		19.	13.
C. B. Hand, Lawrence		31.8	.73	5.30	7	...	16.3
E. Marston, Lawrence		19.	...	...	7	...	11.5

Other boys contesting were: Leland T. Davis, Davidson; Walter Knight, Humphreys; Perry Price, Wilson; Smith Templeton, Franklin; Walter Tidwell, Giles; Albert Froths, Giles; Robert Upshaw, Giles; Estmer Trotter, Giles; Estill Jones, Franklin; Nathan Jones, Franklin; Frank Sullivan, Smith; Clay Cook, Macon; Fred Schnupp, Davidson; Lee Tate, Grundy; Spencer Thomas, Grundy; Albert Zimmerman, Franklin; Ray Ward, Van Buren; Herbert Lusk, Grundy; Clyde Lusk, Grundy; Freedom Parker, Macon; Chas. Judd, Putnam; Edward Mowray, Stewart; J. Herrod, Trousdale; Wale Perkins, Trousdale; Oakley Day, Trousdale; Jim Rankins, Trousdale; Henry Lauderdale, Trousdale; W. P. Herod, Trousdale; Garrett Herrod, Trousdale; James Rankin, Bedford; Guy Choons, Bedford; H. P. Irwin, White; Chas. Johns, White; Will Lee, White; Gaither Webb, Stewart; Thos. Burnett, Davidson; Brice Weeks, Stewart; Carroll Lee, Davidson; Jasper Templeton, Franklin; Lloyd Templeton, Franklin; Chas. Lane, Davidson; Horlas Baker, White; J. B. Hackett, Smith; E. McPeak, White; Claude Carson, White; R. B. Hill, Williamson and H. M. Hill, Williamson.

Ernest Thomas, of Smith County, won \$25.00 prize for Fourth Congressional District.

P. L. Thomas, Howell, Lincoln County, won \$25.00 prize for Fifth District.

C. B. Fain, Clarksville, Montgomery County, won \$25.00 prize for Sixth District.

Jas. Skelton, Cumberland City, Houston County, won \$25.00 prize for Seventh District.

Franklin County won the Loving Cup; Houston County, second; White County, third; Davidson County, fourth; Macon County, fifth; Sumner County, sixth; Lincoln County, seventh; Trousdale County, eighth; Giles County, ninth; Montgomery County, tenth; Wilson County, eleventh; Coffee County, twelfth; Williamson County, thirteenth; Stewart County, fourteenth; Smith County, fifteenth; Rutherford County, sixteenth.

MIDDLE TENNESSEE PRIZES AWARDED.

1.	DeLaval Cream Separator—DeLaval Separator Co., New York	\$ 75.00
2.	Cash—Board of Trade, Nashville	25.00
3.	Cash—Industrial Bureau, Nashville	25.00
4.	Cash—Clearing House Association, Nashville	25.00
5.	Cash—N. C. & St. L. Ry., Nashville	25.00
6.	Two-horse cultivator—John Deere Plow Co., Nashville ..	25.00
7.	Five tons ground rock phosphate—Central Phosphate Co., Mt. Pleasant, Tennessee	23.75
8.	Section harrow—International Harvester Co., Nashville..	12.00
9.	Cash—"The Democrat," Nashville	10.00
10.	\$10.00 in gold—Neely-Harwell Co., Nashville.....	10.00
11.	Cultivator—Greene, Matthews Co., Nashville	8.50
12.	Suit of clothes—H. Solinsky & Co., Nashville	7.50
13.	Stewarts' saddle—Montgomery-Moore Mfg. Co., Nashville..	7.50
14.	Stewart ball-bearing clipping machine—Chicago Flexible Shaft Co., Chicago	7.50
15.	Cash—McKay, Reece & Co., Nashville	5.00
16.	Cash—Cumberland Seed Co., Nashville	5.00
17.	Books—The M. E. Church Pub. Co., Nashville	5.00
18.	One plow—Craig Plow Co., Memphis	5.00
19.	One cultivator—Williams & Co., Memphis	5.00
20.	One pair shoes—Hollins Shoe Co., Nashville.....	4.00
21.	Stetson hat—Pennsylvania Hat Co., Nashville	4.00
22.	One pair shoes—Murray-Dibrell Shoe Co., Nashville	4.00
23.	One pair shoes—Herman Bros., Lindaur Co., Nashville..	4.00
24.	Seed sower—L. H. Hitchcock & Son, Nashville	3.50
25.	One kodak—G. C. Dury Co., Nashville.....	3.00
26.	Cash—Brandon Printing Co., Nashville	2.50
27.	Cash—W. S. Riddle Notion Co., Nashville	2.00
28.	Wool sweater—Park-Comer Textile Co., Nashville	2.00
29.	One hat—Wright Hat Co., Nashville	2.00
30.	Subscription to Country Gentleman—Curtis Pub. Co., Philadelphia, Pa.	1.50
31.	One pocket knife—Gray & Dudley Hdwe. Co., Nashville	1.75

32-38.	Subscription to Progressive Farmer, Memphis	6.00
39-45.	Subscription to Southern Agriculturist, Nashville	3.00
46-50.	Subscription to East Tennessee Farmer, Knoxville	3.00
51-57.	Subscription to Southern Fruit Grower, Chattanooga ..	3.00
100	Corn Club emblems—Farmers E. & C. Union, Tenn.....	12.00
100	Caps and badges—Southern Agriculturist, Nashville.....	50.00
300	Subscriptions to Southern Farm Journal, Chattanooga...	150.00

CONGRESSIONAL PRIZES.

District No. 4, cash—Hon. Cordell Hull	25.00
District No. 5, cash—Hon. W. C. Houston	25.00
District No. 6, cash—Hon. J. W. Byrns.....	25.00
District No. 7, cash—Hon. L. P. Padgett	25.00

COUNTY PRIZE.

One loving cup—B. H. Stief Jewelry Co., Nashville	10.00
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Total prizes for boys of Middle Tennessee\$933.00

BOYS' CORN CLUB OFFICERS.

The following officers were elected by the Middle Tennessee Boys' Corn Club for the ensuing year: President, W. J. Woods, Rutherford County; Vice-President, Estill Jones, Franklin County; Secretary and Treasurer, W. H. Spivey, Sumner County.

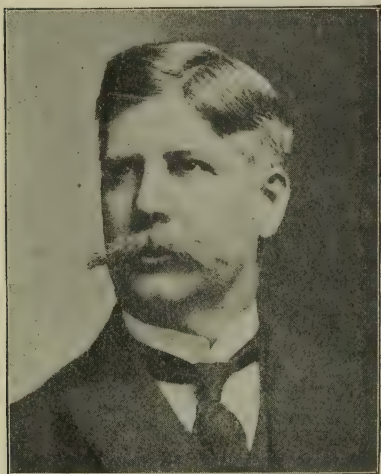


OFFICERS OF MIDDLE TENNESSEE BOYS CORN CLUB.

Center, W. J. Wood, Rutherford County, President; Left, Estile Jones, Franklin County, Vice President; Right, W. H. Spiver, Sumner County, Secretary and Treasurer.

WORK OF THE BOYS' CORN CLUBS.

(By Judge Robert Ewing, Chairman Agricultural Committee, Nashville Board of Trade.)



In estimating the good which is to redound to any given locality in the South from the founding of boys' corn clubs, and the work done by members, the enthusiasm, the ambition to advance and succeed, which nerve boys to faithful efforts to get the best results possible from land, count for a good deal, for without this feeling everything is hopeless, but the real value to themselves and others in what they do consists, first, in their convincing themselves of the possibilities, and secondly, in clearly demonstrating to others what land in the South under intelligent cultivation, can be made to yield.

When one of these boys, at the close of the harvest season, selects and brings in for exhibition, ten fine ears of corn as a selected sample of the quality of the crop, accompanied by a statement of the quantity made on one acre, he does not fully entitle himself to receive any prize that may have been offered. And why? Because there should have been also a statement, made out in writing by himself, showing that he, himself, fully understood how he had achieved such good results, which written statement could be seen and easily understood by others, who might have the ambition and energy to attempt to follow his example.

It was for these reasons that the National Bureau of Plant Industry at Washington (presided over by Mr. Bradford Knapp, who, in a national way, is carrying on the great work begun by his father, Dr. Seaman A. Knapp), formulated and had the government agents send to all members of boys' corn clubs who intended to compete for prizes, printed forms, embodying certain plain questions, which were intended to bring out fully all needed information, and which contained certain instructions as to how to arrive correctly at results. The philosophy and necessity of adopting this course can be easily understood, when it is remembered what purpose Dr. Seaman A. Knapp, the friend of the South, had in view in originally forming these clubs in the South. Briefly stated, he wished:

"First, to have the land so intelligently cultivated that the best results might be obtained in the most economical way.

"Second, to convince the people of the South that with reasonable effort, this could be done; that if corn was cultivated in the way it should be, it would pay the people of the South, this far at least, to diversify their crops, because corn constitutes one of the main articles

of food for man, and meat-producing animals for his use, and that if sufficient bread and meat could be produced at home to sustain those who labored in the fields the money derived from cotton raised would not have to be sent away in purchase of these necessities.

"Third, he chose boys of the South to accomplish this purpose, because he wanted the energy and ambition of youth coupled with freedom from prejudice in favor of past practices, of a different kind."

It would, of course, be perfectly possible to so fertilize and so cultivate one acre as to attain amazing results, but this might prove of very little value as an example to a community, because of the cost incurred and lack of means, in fact, the practical impossibility of following that method in the cultivation of large areas. The thing sought is the aggregate increase in general yield to be attained by the sensible, economical utilization of obtainable fertilizers, but more especially by intelligent and faithful cultivation. Profit is the thing desired. The cost of production, including rental value of land cultivated, must not therefore be allowed to equal the market value of the corn produced. If it does, success has not been obtained. And so, the boy whose statement shows that he availed himself of the decaying vegetation on the land, for fertilizing, and that he first plowed deep to conserve the moisture, and afterwards lightly to aid growth, may be more justly entitled to a prize for good results obtained, for the simple reason that he pursued a plan within the power of all to follow. We do not mean by this to discourage the use of all kinds of suitable fertilizers. Far, indeed, from it. But when these cannot be conveniently obtained, then the utilization of such as are at hand and, particularly, proper cultivation, and herein such a rotation and handling of crops as to make the land feed itself, as far as possible. "The tree sucks kindlier nourishment from the soil, enriched by its own fallen leaves."

The exhibits of corn made by the members of Tennessee Boys' Corn Clubs at the last farmers' institute, held last month in the agricultural building on the State Fair Grounds, were indeed remarkable, far better than any previous exhibits, exciting the intense interest and admiration of all visitors. The judges, however, found that so many of the exhibitors had failed to accompany their exhibits with the statements required, that just awards could not be made at that time. This fact was explained to all the boys exhibiting. By their unanimous vote the award of prizes was postponed until the 22nd day of November to give every competitor the fair opportunity of complying with this condition. Printed blanks were furnished to each. Saturday afternoon, after a full and fair comparison of exhibits, and careful calculations, based on these statements, and results shown, the prizes were awarded on the 24th, and mailed to the successful contestants. A full list, embodying all essentials, were tendered to the papers for publication, that all who took part may fully understand how the awards were made. The government agents did the work. They have an office on the ninth floor of the Stahlman building, and will give any desired information.

To those citizens who generously contributed these prizes grateful

thanks are due and are here tendered. It is hoped that they will feel compensated in having thus encouraged and rewarded the boys of their State for good work, which, if hereafter vigorously and intelligently prosecuted, cannot fail to be of the greatest possible service to the State.

FARM BOYS' ENCAMPMENT AT THE STATE FAIR.

In this number appears an excellent picture of the Farm Boys' Encampment at the Tennessee State Fair. This camp was composed of boys from the various counties in the State. Each county in the State had a chance to send a representative, and most of them did, as will be seen from the list given below.

were submitted to the county paper, and the editor, or a committee appointed by him, decided who was the winner. The boys paid their

One boy from a county was selected by competition in writing. Essays were written on "Why I Want to Go to the Fair," and these railroad fare to Nashville, and this, with their other expenses, was refunded to them by the State Fair.

The camp was under the care of Assistant Adjutant-General Fred Phillips, who was assisted in looking after the boys by J. N. Meroney, of Dark's Mill. All the paraphernalia and conveniences necessary to comfort in camp life were furnished by Adjutant-General Frank Maloney.

The farm boys were under military discipline. At 7 in the morning a "setting up" exercise was given, and then a wholesome breakfast was served in the mess hall, which was large enough to accommodate the entire camp. After that the day's work was begun. This included light duties about the fair grounds and sight-seeing and pleasure.

The camp was divided into squads, and these were detailed to see certain features of the fair each day. One day was devoted to sight-seeing about the city, in cars furnished for that purpose by the Nashville Railway & Light Company free of cost.

Every department of the fair was seen and studied by the boys at the camp, and they spent an enjoyable week at the expense of the State Fair. Early in the afternoon of each day, before leaving the dining hall, the boys listened to addresses from Gov. B. W. Hooper, Commissioner of Agriculture T. F. Peck, Dr. George R. White, R. T. DeBerry, Jesse Tomlinson, Prof. H. A. Morgan, A. L. Garrison and others.

After the fair the boys went home with a better knowledge of the resources of Tennessee, and with a better acquaintance with the people of the State. They will talk about what they saw and make others anxious to see the fair next year, and will doubtless put into practice when they go back to work on the farm much of the excellent advice given them in the lectures heard.

The following counties were represented by the boys named:

MIDDLE TENNESSEE.

Bedford—Clyde Williams, Flat Creek.

Cannon—Will Melton, Woodbury.
Clay—Charles Poindexter, Celina.
Coffee—Dawson Mays, Manchester.
Cumberland—Herbert Wilson, Watson.
DeKalb—Wiley M. Dinkins, Alexandria.
Dickson—Emmet Herrin, Burns, and John Miller, Sylvia.
Fentress—Roscoe M. Hogue, Jamestown.
Giles—Flournoy Morris, Wales.
Grundy—Clarence Aylor, Alto.
Hickman—Archie Carroll, Lykes, and Willie Atkinson, Centreville.
Humphreys—Dale Carter, Waverly, R. F. D.
Jackson—Fred H. Richmond, and Bruce Settle, Gainesboro.
Lawrence—Ellis Mabry and Lawrence Springer, Lawrenceburg.
Lincoln—George Turlev, Fayetteville.
Macon—Frank Perkins, Hartsville, R. F. D.
Marshall—John Allison, Chapel Hill.
Mauv—Rufus Baker, Columbia, R. F. D. 4.
Montgomery—Howard Riggins, Clarksville, R. F. D. 4.

EAST TENNESSEE.

Anderson—Leonard H. Roberts, Robertsville.
Bledsoe—Samuel Stephens, Pikeville.
Blount—Lloyd Lee, Greenback.
Bradley—Calvin Ayer, Cleveland.
Cocke—James Murray, Newport.
Greene—Carl Bell and Sidney Hampton, Greeneville.
Hamblen—L. M. Mooney, Morristown.
Hamilton—Paris A. Bryant, Tyner.
Hancock—H. K. Arnold, Sneedville.
Hawkins—Hamilton Steel, Rogersville.
James—Carl Moore, Shepherd.
Jefferson—Clvde Dinwiddie, Newmarket.
Johnson—R. R. Madron, Mountain City.
Loudon—Homer Simpson, Loudon, and Stanley Barnett, Martel.
Marion—Harry Brown, Jasper.
McMinn—Hubert Milton, Etowah.
Meigs—Edwin Arrant and Charles Arrant, Decatur.
Monroe—John G. Straley, Sweetwater.
Polk—August McClarin, Benton.

WEST TENNESSEE.

Benton—Carson Dobson and Willie DeVant, Camden.
Carroll—Ben Cote, Buena Vista.
Chester—R. McKinney Seaton, Henderson.
Crockett—John C. Lewis, Tigrett.
Decatur—Charles White, Decaturville.
Dyer—Thomas H. Townsend, Newbern.
Gibson—John Fly, Milan.
Hardeman—George Hinds, Whiteville.

Hardin—Charlie Kirk, Savannah.

Haywood—Richard Langford, Brownsville.

Henderson—William Douglass, Uno, and Howard Pearson, Lexington.

Henry—Hobart Giff, Lexington.

Lake—Finch Moore, Ridgely.

Madison—Roy Warmoth, Jackson.

McNairy—Homer McCollum, Corinth.

Obion—Hardy McNeeley, Kenton.

Shelby—Raymond Johnson, Ellendale.

Tipton—James Ruffin, Covington.

Weakley—Frank L. Doran, Greenfield, and Lowell Parish, Martin.

THE TENNESSEE STATE FAIR.

The 1913 Tennessee State Fair was the most successful in the history of this great exposition of the resources of Tennessee. The paid attendance on the best day of the Fair, Thursday, October 2, was more than 34,000.

The Fair paid out in premiums this year more than \$35,000, and the receipts from all sources about paid the expenses of holding the Fair.

POULTRY NOTES.

Pekins lay from 120 to 170 eggs a year.

Forcing for eggs out of season is unprofitable.

Keep the hens' nests clean and provide one for every four hens.

If fowls are compelled to roost in foul and damp houses it causes illness.

The earlier the maturity, all other things being equal, the greater the profits.

Sell off your old roosters and get a better one than you ever had of some neighbor.

The chick that is alive ten days after hatching has most of its dangers behind it.

If a fowl becomes sick, separate it from the others and doctor it, as the disease may be contagious.

Laying hens drink a very large amount of water if it is clean and kept constantly before them.

The old rule of improving the human race by beginning with the grandparents applies also to poultry raising.

For hatching purposes take the eggs from the hens that lay best. Build up; never let the standard down.

A shelf a couple of feet below the roosts is handy to catch the droppings and handy to clean. And don't forget to clean it.

Breeding stock should be carefully selected by the poultryman and then given the best care, plenty of fresh air, sunshine and exercise.

CROP REPORT FOR NOVEMBER.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., December 1, 1913.**

The Department of Agriculture received reports from crop correspondents in only seventy-three of the ninety-six counties of the State for the crop month ending November 20, and the reports coming in were rather vague and incomplete.

Reports received indicate that there was a larger area sown in winter wheat, oats and rye than at the same time last year. Farmers took advantage of the splendid weather during October and the first half of November to look after this work.

As indicated the former reports, the corn production for this year was less than two-thirds of last year, the figures given for the yield per acre this year—24—probably being higher than the actual production would bear out.

The figures given on the yield of cotton per acre are probably misleading also, as it is generally claimed in the cotton markets and in the cotton producing section of the State, as well as shown by the reports of cotton ginned, that the production this year was in excess of that last year.

The yield of late Irish potatoes shows considerable reduction from last year, owing to drouth during the growing period. Tobacco shows an increase over last year, as does peanuts.

Young clover and alfalfa show deterioration in condition from the same period last year. Live stock is in fairly good condition, except where farmers are suffering from the ravages of hog cholera. It is hoped that the establishment of the State plant for the manufacture and distribution of anti-hog cholera serum will materially lessen this trouble in the State in the near future.

No further crop report will be issued from this department until April 1, 1914.

Below is the summary for comparison of the crop reports of this department for November, for the years 1912 and 1913:

	1912.	1913.
Wheat, acreage sown, per cent.....	72	88
Winter oats, acreage sown, per cent.....	77	81
Rye, acreage sown, per cent.....	73	80
Corn, bushels, per acre.....	35½	24
Cotton, pounds, per acre.....	519	477
Millet seed, threshed, per cent.....	72	63
Stock peas, seed threshed, per cent.....	65	64
Sweet potatoes, yield, per cent.....	78	73
Late Irish potatoes, yield, per cent.....	73	57
Tobacco, pounds, per acre.....	657	706
Broom corn, yield, per cent	67	51
Peanuts, bushels, per acre.....	59	64
Live stock, condition, per cent.....	89	89
Young clover, condition, per cent.....	88	64
Alfalfa, condition, per cent.....	88	80

NOVEMBER CROP REPORT FOR 1913—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Wheat—acre- age sown.	Winter Oats— acres sown.	Rye—acres sown.	Corn—bushels per acre.	Cotton—pounds per acre.	Millet Seed— threshed.	Stock Peas— seed threshed.	Sweet Potatoes— yield per acre.	Late Irish Pota- toes—yield.	Tobacco—pounds per acre.	Broom Corn— per cent.	Peanuts—bushels per acre.	Live Stock— condition.	Young Clover— condition.	Alfalfa—con- dition.
A Alluvial plain of the Mississippi River and Plateau Slope of West Tennessee.	Lake	100	100	100	15	650	100	100	100	100	600	100	75	100	60	100
	Obion	100	100	100	15	600	100	100	100	100	600	100	75	100	60	100
	Dyer	100	100	100	15	600	100	100	100	100	600	100	75	100	60	100
	Lauderdale	60	100	100	20	600	100	100	100	100	600	100	75	100	60	100
	Tipton	60	100	100	20	600	100	100	100	100	600	100	75	100	60	100
B Brown Loam Ta- blelands, Middle Counties of West Tennessee.	Shelby	60	100	100	20	550	100	100	100	100	600	100	75	100	60	100
	Weakley	60	100	100	25	500	100	100	100	100	600	100	75	100	60	100
	Gibson	85	95	90	20	300	100	100	100	100	600	100	75	100	60	100
	Crockett	40	50	40	20	500	100	100	100	100	600	100	75	100	60	100
	Madison	100	65	100	30	300	100	100	100	100	600	100	75	100	60	100
C Summit Region of Watershed, West Tennessee.	Haywood	80	90	90	15	300	100	100	100	100	600	100	75	100	60	100
	Hardeman	80	90	90	20	500	100	100	100	100	600	100	75	100	60	100
	Fayette	60	50	40	15	400	100	100	100	100	600	100	75	100	60	100
	Henry	95	100	100	19	450	100	100	100	100	600	100	75	100	60	100
	Carroll	95	100	100	19	450	100	100	100	100	600	100	75	100	60	100
D Valley of Tennes- see River, West and Middle Tennessee.	Henderson	45	90	55	17	450	100	100	100	100	600	100	75	100	60	100
	Chester	45	90	55	17	450	100	100	100	100	600	100	75	100	60	100
	McNairy	45	25	30	15	500	100	100	100	100	600	100	75	100	60	100
	Stewart	100	100	100	20	600	100	100	100	100	600	100	75	100	60	100
	Benton	100	85	15	17	600	100	100	100	100	600	100	75	100	60	100
	Houston	100	90	100	20	600	100	100	100	100	600	100	75	100	60	100
	Humphreys	60	75	75	30	400	100	100	100	100	600	100	75	100	60	100
	Decatur	100	100	100	20	400	100	100	100	100	600	100	75	100	60	100
	Perry	100	100	100	25	400	100	100	100	100	600	100	75	100	60	100
	Hardin	60	100	50	25	400	100	100	100	100	600	100	75	100	60	100

E Highland Rim of Middle Tennessee, Western Subdivision.	Montgomery	90	95	90	40	80	60	800	85	25	85	25
	Robertson	90	95	90	25	70	50	750	90	20	90	20
	Cheatham	95	90	70	25	90	50	750	90	20	90	20
	Dickson	90	90	100	25	70	50	750	90	20	90	20
	Hickman	90	90	100	25	70	50	750	90	20	90	20
	Lewis	90	90	100	25	70	50	750	90	20	90	20
	Wayne	100	60	75	20	75	50	750	90	20	90	20
	Lawrence	100	60	75	20	75	50	750	90	20	90	20
	Macon	80	90	95	20	30	75	25	95	25	95	25
	Clay	100	100	100	20	100	85	100	95	75	95	75
	Pickett	100	100	100	25	100	85	100	90	75	90	75
	Overton	90	80	85	25	40	45	40	75	75	75	75
	Jackson	80	85	75	25	40	40	40	75	75	75	75
	Putnam	65	75	65	25	40	40	40	75	75	75	75
F Highland Rim of Middle Tennessee, Eastern Subdivision.	Hickman	100	100	100	25	100	100	80	100	100	100	100
	DeKalb	100	100	100	25	100	100	80	100	100	100	100
	White	100	100	100	25	100	100	80	100	100	100	100
	Warren	75	60	75	30	75	85	50	90	75	90	75
	Coffee	75	75	75	20	60	90	50	80	100	80	90
	Franklin	80	75	75	20	60	90	50	80	100	80	90
	Sumner	80	60	50	15	50	50	50	75	20	75	20
	Trousdale	100	50	75	20	50	50	50	90	60	90	60
	Smith	100	100	80	20	70	50	50	100	20	100	20
	Davidson	100	100	80	20	70	50	50	100	20	100	20
	Wilson	90	20	20	25	75	50	50	90	20	90	20
	Williamson	85	20	20	25	75	50	50	90	20	90	20
	Rutherford	90	30	85	35	50	50	30	100	25	100	25
	Canon	100	90	100	40	30	30	20	80	20	80	20
G Central Basin.	Maury	100	100	100	45	85	50	50	90	95	90	95
	Marshall	100	100	100	40	85	50	50	90	95	90	95
	Bedford	100	100	100	40	85	50	50	90	95	90	95
	Giles	100	100	100	45	85	50	50	90	95	90	95
	Lincoln	100	100	100	40	85	50	50	90	95	90	95
	Moore	70	40	80	30	50	50	50	95	50	95	45
	Scott	70	40	80	30	50	50	50	95	50	95	45
	Fentress	100	100	100	45	85	50	50	90	95	90	95
	Morgan	100	100	100	40	85	50	50	90	95	90	95
	Cumberland	100	100	100	40	85	50	50	90	95	90	95
	Van Buren	90	80	100	15	100	40	40	100	85	100	80
	Grundy	100	100	100	15	100	40	40	100	85	100	80
		100	100	100	15	100	40	40	100	85	100	80
		100	100	100	15	100	40	40	100	85	100	80
H Cumberland Table- land.	Montgomery	90	95	90	40	80	60	800	85	25	85	25
	Robertson	90	95	90	25	70	50	750	90	20	90	20
	Cheatham	95	90	70	25	90	50	750	90	20	90	20
	Dickson	90	90	100	25	70	50	750	90	20	90	20
	Hickman	90	90	100	25	70	50	750	90	20	90	20
	Lewis	90	90	100	25	70	50	750	90	20	90	20
	Wayne	100	60	75	20	75	50	750	90	20	90	20
	Lawrence	100	60	75	20	75	50	750	90	20	90	20
	Macon	80	90	95	20	30	75	25	95	25	95	25
	Clay	100	100	100	20	100	85	100	95	75	95	75
	Pickett	100	100	100	25	100	85	100	90	75	90	75
	Overton	90	80	85	25	40	45	40	75	75	75	75
	Jackson	80	85	75	25	40	40	40	75	75	75	75
	Putnam	65	75	65	25	40	40	40	75	75	75	75

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J Cumberland Table- land and Valley of East Tennessee.	Claiborne															
	Campbell	50	80	75	30		10		40			20		75	60	25
	Anderson	100	80		30			70	50	50				95	50	75
	Rhea	90	95	85	30			50	75	60				95	60	
	Bledsoe	100	100	100	30			50	90	30			30	100	80	85
	Sequatchie	75	100	100	18			50	90	40				90	75	
	Marion															
	Hamilton	75	75	50	20			25	75	20				60	50	
	Sullivan															
	Hawkins	100	75		40		20	20	75					100	75	
K East Tennessee Valley.	Hancock	100	100		30			100	75	75				100	80	
	Washington	95	95		18		70							95	80	
	Hamblen	100	70	100	15		40		90	40				90	100	
	Granger	100	80		20			80	75	85				85	70	
	Union	80	85	50	10		40	60	50	40				85	85	75
	Jefferson															
	Knox															
	Roane	100	80	95	25			50	100	50				100	60	70
	Loudon	60	50	40	20		50	50	75	75				75	50	
	McMinn	95	100		35									95		
L Valley of East Tennessee and Unaka Region.	Meigs	100	100	100	25		50	50	50					90	90	
	Bradley	90	40	50	30	500	90	70	75		400	50	80	50	40	
	James															
	Johnson	100	100	100	25				100					100	85	
	Carter	100	100	100	20			90	85	60				95	90	
	Unicoi										900			95		
	Greene	95	85		35			90								
	Cooke	100	100	80	10			90	60	75				95	100	90
	Sevier	90	85		20		75	60	75					95	95	
	Blount	80	85	75	15				90				75	80	85	85
	Monroe	80	85	75	40		30	25	70			50		100	50	95
	Folk	100	100	100	15			50	50					90	75	
	Average	88	81	80	24	477	63	64	73	57	706	51	64	89	64	80

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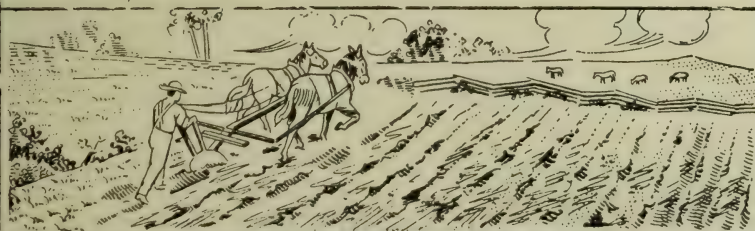
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IN THIS ISSUE:

TABULATED ANALYSES
OF
COMMERCIAL FERTILIZERS



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TENNESSEE BULLETIN

TABULATED ANALYSES
OF
COMMERCIAL FERTILIZERS
and FERTILIZER MATERIALS

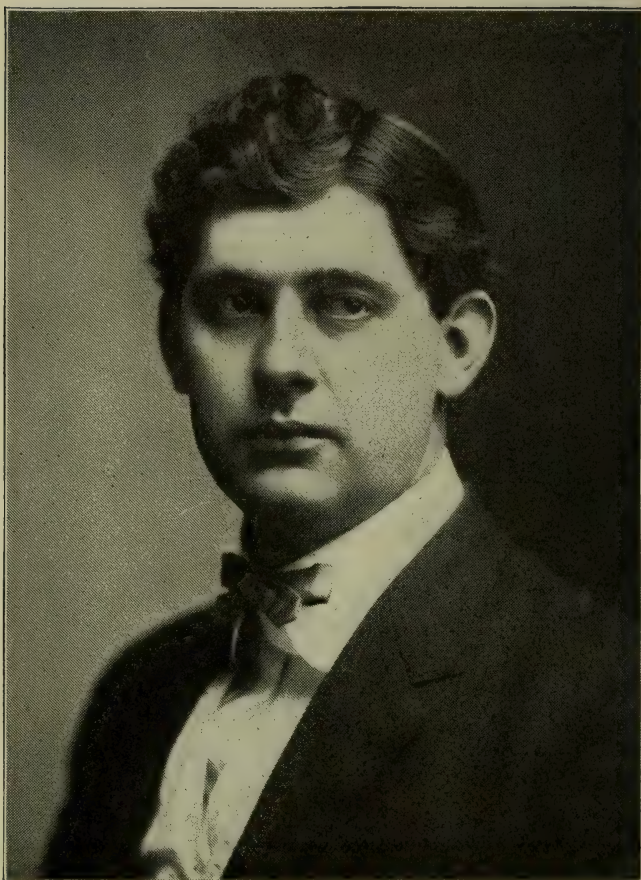
From Samples Drawn in Ac-
cordance with the Law, by the
Department of Agriculture

From January 1, 1913, to January 1, 1914

T. F. PECK, Commissioner

COMPILED BY
J. W. SAMPLE, State Chemist
AND
A. L. GARRISON, Chief Fertilizer Inspector

This Bulletin Furnished Free Upon Application to this Department.



A. L. GARRISON
CHIEF FERTILIZER INSPECTOR.

FERTILIZER BULLETIN FOR THE YEAR 1913.

There has been a steady increase in the use of commercial fertilizers as evidenced by the following comparison of the figures for previous years: The increase of 1912 over 1911 was 4,772 tons. The increase of 1913 over 1912 was 10,962 tons. The record shows that there was sold to Tennessee farmers during 1913 84,060 tons.

The primary object of this bulletin is the publication of the analyses of all brands of commercial fertilizers offered for sale in Tennessee during the year 1913.

These analyses, together with the guaranteed analyses of the manufacturers, are given in tabulated form, and a careful study of these tables should be of great help to the farmer in selecting the brands of fertilizer best suited to his needs.

Selections should not be based on brands or trade names, but should be based on the actual amount of plant food shown by the analysis. Frequently these trade names have absolutely no relation to the composition of the fertilizer, and often they are misleading. As an example: The name "High Grade Dissolved Bone" is one that is very popular. From the name one would infer that this material was made from animal bones, while in reality, in nine cases out of ten, the material is simply acid phosphate made from Tennessee and Florida phosphate rock, and contains no trace of animal bone.

A phosphate made from animal bone contains nitrogen, and when the names "Dissolved Bone," "Acidulated Bone," "Soluble Bone," etc., are used, you would expect to find nitrogen in the material so named. But the cases in which nitrogen is found in these materials are very rare.

A very simple method for distinguishing between a phosphate made from phosphate rock and one made from animal bone is an examination of the guaranteed analysis. If the guaranteed analysis shows no nitrogen, it is safe to assume that no bone was used, and that the material was made from phosphate rock, while if the guarantee shows nitrogen, it is probable that animal bone was used.

There are many other trade names that might be misleading, and in buying a fertilizer no attention should be given to these trade names, but the guaranteed analysis should be the guiding factor. The law requires that the analysis be plainly printed on each bag, and any manufacturer who fails to print the analysis on a bag of fertilizer is subject to prosecution.

As a rule, the manufacturers are honest people and are sincere in their efforts to comply with the fertilizer laws. It seldom happens that the analysis of the State Chemist agrees exactly with that of the manufacturer, but the variation is rarely great enough to materially affect the valuation of the fertilizer in question. These variations may

occur between the different plant food elements and still the calculated value, based upon the two analyses, be approximately the same.

An examination of the analyses given in this bulletin will show that only a small percentage of the brands analyzed fell below, while quite a number ran higher than the manufacturers' guarantee.

In addition to the tabulated analyses and valuations of fertilizers given in this bulletin will be found brief notes and suggestions, gleaned from various sources, on subjects that should be of vital interest to every progressive farmer, and it is hoped that these will be given careful consideration.

Limited space prevents the thorough treatment that the importance of these subjects merits, hence only the most important points will be considered.

THE SOIL.

Soils are the result of the breaking up of the rocks which originally composed the earth's surface. The agencies which brought about this breaking up, or disintegration, were: Heat, cold, water, gases, micro-organisms and plant life acting through a vast extent of time.

Since the earth's surface is composed of rocks of greatly varying composition, we find the soils in different localities to be of different compositions, depending upon the character of the rock from which it was formed. Thus, limestone rocks break up, forming soils rich in lime compounds; quartz produces the light sandy soils, and the clay soils, in the same way, are the product of the breaking up of the more complex silicates like feldspar, etc.

With the exception of quartz, practically all of the rocks contained more or less of the mineral elements necessary to plant life, and in the process of disintegration these elements are to an extent retained and rendered available in the resulting soil.

In many instances we find the soil of entirely different composition from the rocks of the locality. Especially is this noticeable in bottom and low lands. Such soil was not formed in place, but was transported from some other locality by water or other agencies. Such soils are usually of considerable depth and rich in plant food. Numerous analyses and tests have shown that practically all of the soils of Tennessee contain large amounts of the mineral elements of plant food, viz., phosphorus, potassium, and calcium or lime, but whether or not these elements are in form available to plant life is something that a chemical analysis will not determine.

The elements of plant food that have been proven to be indispensable to plant life and growth are phosphorus, potassium, nitrogen and calcium. Phosphorus, potassium and calcium compounds are known to be plentiful in the majority of Tennessee soils, though in many cases the amounts of these elements in available form are deficient. Nitrogen, while it exists in nature in inexhaustible quantity, is

found in very limited quantities in the soil, and it is of the utmost importance that this element be supplied.

Soils may contain all of the elements of plant food, and still fail to be productive. This is often due to a bad physical condition, which can usually be corrected by deep and thorough tillage and application of lime. The mineral elements of plant food are present in the subsoil as well as in the surface soil, and when the surface becomes depleted of these elements, more can be brought up and made available by subsoiling or by growing deep rooted plants like alfalfa. Under all conditions, to get the best results from a soil, good physical condition is essential.

NITROGEN.

Nitrogen occurs in nature in the following forms: Atmospheric nitrogen, ammonia, nitrates and in animal and vegetable matter.

Nitrogen gas in the free state constitutes about four-fifths of the air, an amount equal to many thousand tons for every acre of land. This atmospheric nitrogen is not directly available to the growing plants, but certain plants belonging to the leguminous family have the power of indirectly using it through the medium of certain micro-organisms or bacteria. These bacteria possess the power of extracting the nitrogen from the air and converting it into a form directly available to the plants. These bacteria are comparatively common in soils, especially in soils where legumes have been grown, but occasional instances have been observed where no nodules formed on the roots of legumes. In such cases the legume bacteria is either absent or inactive if present. The latter condition may be due to acidity in the soil or the lack of organic matter to feed upon.

Where the bacteria are known to be absent the trouble may be corrected by inoculation, or the addition of the bacteria to the soil, which may be accomplished in one of two ways, viz., by spreading a small amount of the soil from fields that are known to contain the particular bacteria wanted, or by the application to the seed of pure cultures of the bacteria. These pure cultures have been prepared and are on the market. The former method of inoculation is much to be preferred, as the pure culture method has proven a failure in many cases.

It must be borne in mind, in this connection, that these nitrogen-fixing bacteria cannot live in an acid soil, and thrive best in a soil which contains an ample supply of lime. Hence it is a safe plan, where there is any doubt about the acidity, to give the soil an application of caustic lime or ground limestone.

The presence of the nitrogen-fixing bacteria is denoted by the appearance of nodules on the roots of the plants, and wherever there is an absence of these nodules on the roots of leguminous plants, it is a sure indication that there is something radically wrong, and the farmer should get busy and locate and correct the trouble, which may be acid-

ity, absence of organic matter, or the absence of the particular bacteria which the legume requires.

The nitrogen extracted from the air by the bacteria is not all consumed by the growing plant, the rest being left behind in the roots and nodules when the crop is removed, and the soil is enriched thereby, and if the whole crop is allowed to remain and is turned under, the whole of the nitrogen extracted is added to the soil. Nitrogen being the most expensive of all the plant foods, costing from three to five times as much as either of the mineral elements, it should be of especial importance to the farmer to procure as much as possible of this valuable plant food from the inexhaustible free supply—the air. Proper rotation and applications of lime will bring about this result.

Nitrogen, in combination with hydrogen as ammonia, occurs to a very limited extent in the atmosphere, and it is said that some plants have the power of using it. Ammonia is also one of the products of decaying organic matter. Its characteristic odor is usually present around rotting manure piles, etc. As a general rule, ammonia nitrogen is not directly available as a plant food, but must be first changed to the form of nitrate.

Stable or barnyard manure is a very valuable source of nitrogen, and one to which the farmer cannot pay too much attention. Analyses have proven that the liquid excrements of animals, with a few exceptions, contain a very large amount of the elements of plant food. But how many farmers do we find who are making any extra efforts to conserve this liquid? It has been stated that a concrete stable floor will more than pay for its construction in two years, and such a floor will last a lifetime. Proper bedding is also a great help in preventing loss in the stable, and the sprinkling of small quantities of sulphate of lime in the stable is said to be beneficial. Ground phosphate applied in the same way should help, not only in preventing loss, but the insoluble phosphates are to an extent rendered available by the action of the manure.

In addition to nitrogen, both phosphorus and potassium are contained in the excrements of animals, both solid and liquid.

The following table will give some idea of the value of the manures produced on the farm by the common farm animals, and it is hoped will impress upon the farmers the importance of the conservation of this valuable farm product.

The values in the last column are based on the following schedule of prices per pound:

Nitrogen in liquid, 16 cents per pound.

Nitrogen in solid, 12 cents per pound.

Phosphoric acid in liquid, 5 cents per pound.

Phosphoric acid in solid, 4 cents per pound.

Potash in liquid, 5 cents per pound.

Potash in solid, 4 cents per pound.

The figures given in this table represent the plant food constituents and values produced annually by farm animals per 1,000 pounds live weight:

Kind of Animal	Nitrogen		Phosphoric Acid		Potash		Value
	Solid	Liquid	Solid	Liquid	Solid	Liquid	
Horse	79	49	43	..	58	45	\$23.60
Cow	76	80	38	..	19	108	29.60
Hog	101	49	92	12	73	55	30.00
Sheep	62	57	42	2	38	88	24.25
Hens	85	..	68	..	32	..	18.70

In addition to its value based on the plant food it contains, this manure is of very great value for the reason that it supplies a large amount of organic matter, which is indispensable to the best crop producing conditions.

Other sources of nitrogen are:

(1) Nitrate of soda, which is imported.

(2) Ammonia salts, produced mainly as by-products in the manufacture of gas and coke.

(3) Cyanamid, which is being produced both in this country and abroad, and bids fair to become one of our chief sources of nitrogen. The manufacture of this material is based upon the fact that under certain conditions the nitrogen of the air can be made to combine with some of the inorganic elements and compounds to form a compound of fixed composition, which can be handled and used to provide nitrogen in a form available to plant life.

(4) Organic materials, including cottonseed meal, tankage, fish scrap, dried blood and bones.

The form in which nitrogen is directly available to plant life is the nitrate form, and no matter what its form or combination when applied, it must first undergo a change to the soluble nitrate form before it can be assimilated by the growing plants.

Nitrogen is essential to the formation of leaves and stems in plants; an abundance of this element in the soil is quickly shown by a luxuriant growth of leaves and stems. A deep green color is imparted to the leaves by nitrogen.

While a certain amount of available nitrogen is absolutely essential to plant growth, it is possible to use too much of this element. The effect of too much nitrogen is apparent in the retarded growth of flowers, and in late maturing of crops. At a certain stage of growth most plants cease to produce stems and leaves, and commence to produce flowers and fruits for the development of seeds.

If the plant has too much available nitrogen at this stage, other conditions being normal, the process of flowering may be checked, and the activity of growth transferred to the leaves and stems, giving rise to a second growth of these at the expense of the fruit and seed.

For this reason, a crop grown on a soil excessively rich in nitrogen always shows a tendency to ripen slowly, and the quality of the grain is

usually lowered. Another bad effect of too much nitrogen on crops is that it seems to weaken their power of resistance to diseases and fungus growths. Wheat grown on land too rich in nitrogen is more liable to "rust" than otherwise. In the growing plant, the nitrogen is present in larger proportions, first in the leaves and finally in the seeds, and when these are removed the nitrogen is taken off with them.

PHOSPHORUS.

Compounds of phosphorus are found practically everywhere in soils, and the original source of all phosphates is the rocks of the surface of the earth. These rocks are broken up, as before described, forming the soil; the soil retains the phosphorus, and it is in turn taken up by the plants; the animals eat the plants, and some of the phosphorus is assimilated, going mainly to make up the bones of the body. What is not taken up by the body is passed out and returned to the soil as manure.

The two sources of phosphorus and phosphates are animal bones and rock phosphate, the latter being very abundant in Middle Tennessee. The phosphorus, or phosphoric acid, contained in these materials is not in form available to plant life, but on treatment with sulphuric acid it is rendered soluble, therefore available. The product so prepared constitutes the acid phosphate in common use, which contains from 12 per cent to 18 per cent phosphoric acid in available form.

The insoluble phosphates, as they naturally occur in the soil, are to an extent rendered available by solution in water containing carbon dioxide. The presence of some materials applied as fertilizer also have a tendency to increase their solubility, among which may be mentioned nitrate of soda, sulphate of ammonia, sulphate of potash, caustic lime and limestone. Gypsum and compounds of iron and aluminum make them less soluble.

The presence of decaying organic matter in soils furnishes free acids and carbon dioxide, these creating conditions favorable to the solution of the insoluble phosphates. The presence of lime is of especial value in preventing the formation of the insoluble phosphates of iron and aluminum.

The insoluble phosphates in the soil, as well as those added in the form of farm manure, ground bone, ground phosphate rock, etc., are rendered to an extent soluble by soil bacteria, but in order for this to occur, the soil must be well supplied with lime.

Phosphorus compounds are essential to plant growth and their effects can be observed in the growth and maturing of crops.

Phosphorus stimulates the germination of the seed, and aids rapid development of the young seedling by stimulating the growth of roots, thus giving the young plant a good start and rendering it better able to withstand any unfavorable conditions that may arise later on in its growth.

The presence of soluble phosphates hastens the ripening of crops, and the formation of grain begins sooner when this material is plentiful. This maturing effect of phosphates is due to the close relation they bear to seed production, which is evidenced by the fact that compounds of phosphorus are always found in larger amounts in the seed than in any other part of the plant.

The generous use of soluble phosphates increases the proportion of grain to the straw. The two latter effects of phosphorus compounds are just the opposite of the effects of the heavy application of nitrogen—the one tends to hasten maturity and increases grain production, while the other retards maturing, and tends to produce leaves and stems at the expense of the grain.

POTASSIUM.

Most of the rocks contain potassium in some form of combination, and as in the case of phosphorus, the potassium is found in the soil resulting from the breaking up of these rocks. As a rule, the amount of soluble or available potassium compounds found in the soil is very small, and as they are essential to plant growth, they must either be supplied or the insoluble compounds existing in the soil must be rendered available. Besides the compounds of potassium already existing in the soil, there are several sources from which they are derived.

Wood ashes is an important source of potassium, containing the equivalent of about 5.5 per cent of potash. Ashes also contain a small amount of phosphorus and a large amount of lime.

For a good many years the bulk of the potassium compounds used in this country have come from Germany. These German salts come under various names, some of which are as follows:

Muriate of potash, which contains about 50 per cent of potash.

Sulphate of potash, which contains about 48 per cent to 50 per cent potash.

Double manure salt, which contains about 22 per cent potash.

Kainit, which contains about 12.5 per cent potash.

All of these compounds are soluble in water, and are therefore at once available as plant food.

Other sources of potassium compounds are cotton seed hull ashes, tobacco stems, stalks and waste products from tobacco factories, waste products from sugar factories.

Of recent years the Federal Government has been very active in making search for supplies of potassium in this country. So far, the most important source to be reported is the enormous seaweed or "Kelp" fields on the Pacific Coast. These promise to reach great importance as a source of potash.

The action of potassium in plants is especially energetic in the

production of stems and the woody parts. A soil deficient in this element produces plants whose stems are small, weak and brittle. Like nitrogen, potassium in excessive amounts has a tendency to retard the ripening of crops, causing abnormal growth of leaves, stems and woody parts at the expense of the fruit and seed.

Potassium has the power of aiding plants to withstand diseases of a fungus nature.

Potassium compounds seem to be especially beneficial to leguminous crops; it has been suggested that they promote the growth of the bacteria which form the root nodules.

LIME.

The base of all so-called lime compounds is the element calcium. This element is the most abundant of any of the plant food elements, and is, with a few possible exceptions, contained in all soils. Like the other mineral plant food elements, it is derived from the original rocks, and, like them, may be plentiful in the soil but still not in a form available to plant life.

Lime in some form is essential to plant life and growth, as is shown by the large amounts present in the ashes of all plants. Its use by the farmers is becoming more extensive each year. The forms commonly used are: Calcium carbonate as ground limestone, caustic or quick-lime, hydrated or slaked lime, and gypsum or land plaster.

Where the freight is not prohibitive, the ground limestone is to be preferred, as the other forms are supposed to be converted to the carbonate form before they are of any benefit to the plants. Where the haulage is long, and freight high, it is advisable to buy caustic lime and apply either in that form or as hydrate after slaking with water. Do not apply caustic lime to growing plants, as it is injurious to them, when used in this form it should be applied some time before planting. Fifty-six pounds of caustic lime is equivalent to 100 pounds of the ground limestone.

Lime performs several functions in the production of crops, all of which are of great importance. Few useful plants will thrive, or even grow, in acid soils, while there are some varieties of weeds that seem to thrive in acid soils. A heavy growth of weeds on a soil that will not produce good crops is an indication of acidity. For this condition lime in liberal quantities is an excellent remedy. Acidity in the soil is antagonistic to the growth of the soil bacteria, hence the apparent partiality of the legumes, especially alfalfa, for lime soils.

Another important function of lime is its ability to liberate potash from its insoluble compounds and convert it to a soluble form. Lime improves the texture of soils, both sandy and clay soils being helped by its application, and it has a strong tendency to enable crops to withstand drouth and other adverse conditions.

Since we have seen that most of our soils already contain the two mineral elements of plant food—phosphorus and potassium—and that nitrogen can be supplied through the medium of soil bacteria and organic matter, it would seem to be poor economy to pay big prices for commercial fertilizers, in order to get something which we already have in abundance, even though it may not be in immediately available form. We have seen that by the application of lime and organic matter, and the growing of legumes, the availability of the plant food elements is greatly increased, so why not give the soil a chance to enrich itself by giving these methods a trial? Then, if it fails to respond to such treatment, it is time to give it assistance by the application of commercial fertilizers. In other words, if deep plowing, the application of lime and organic matter, and the turning under of a leguminous crop fail to give the desired results, it is good evidence that the soil is depleted of plant food, and this deficiency must be made up by the addition of plant food from some source. This may be accomplished either by the application of ready mixed commercial fertilizers or the farmer may buy his plant food materials and do his own mixing.

The advantage of home-mixing is mainly that it is cheaper. The farmer, or clubs of farmers, should be able to buy the bulk plant food materials almost as cheaply as the fertilizer manufacturer can buy them. This would eliminate the manufacturer's cost of mixing and bagging, and his profit also. Then the farmer would not be compelled to pay freight on a large amount of useless material such as goes to make up the "filler" of mixed fertilizers.

Of course the mixing as done at home by the farmer cannot be expected to be as thorough as that done by the manufacturer, who has machines especially designed for this work, and here lies the main objection to home mixing. The market prices of the common fertilizer materials, unmixed, will be found further on, and from these the farmer can figure whether or not it will be cheaper to buy his plant food already mixed, or buy the raw materials and do his own mixing. For the benefit of those who desire to do their own mixing, the following method of making the necessary calculations is given: Say, for example, you have acid phosphate containing 16 per cent available phosphoric acid, muriate of potash containing 50 per cent potash and nitrate of soda containing 15 per cent nitrogen, and want to make a mixture containing the following percentages of plant food:

Available phosphoric acid	10%
Nitrogen	4%
Potash	5%

The first step is to find the number of pounds of each of the plant food constituents contained in such a mixture. This is done by multiplying the percentage desired by 20. Thus:

Phosphoric acid—10% x 20=200 pounds in a ton.

Nitrogen — 4% x 20= 80 pounds in a ton.

Potash — 5% x 20=100 pounds in a ton.

100 pounds acid phosphate contains 16 pounds phosphoric acid.

100 pounds nitrate of soda contains 15 pounds nitrogen, and

100 pounds muriate of potash contains 50 pounds potash.

Therefore, if 100 pounds of acid phosphate gives 16 pounds phosphoric acid x pounds will give 200 pounds phosphoric acid.

Thus $\frac{200 \times 100}{16} = 1250$ pounds of acid phosphate required.

Since 100 pounds of nitrate of soda gives 15 pounds nitrogen, x pounds will give 80 pounds nitrogen.

Thus $\frac{80 \times 100}{15} = 533$ pounds of nitrate of soda required.

Since 100 pounds of muriate of potash gives 50 pounds potash, x pounds will give 100 pounds potash.

Thus $\frac{100 \times 100}{50} = 200$ pounds of muriate of potash required.

Then we have to use:

Acid phosphate	1,250 pounds.
Nitrate of soda	533 pounds.
Muriate of potash	200 pounds.

1,983 pounds.

You will note that the figures do not total up quite a ton, or 2,000 pounds. This is where the use of a filler comes in, enough of some inert material is added to bring the total weight up to 2,000 pounds, and we have a ton of fertilizer of the desired composition. In the application of commercial fertilizer, whether ready mixed or home mixed, the needs of the particular crop to be grown must be considered. A heavy application of potash to a wheat crop on clay land, or an application of nitrate of soda to a clover crop, or of limestone to a strong limestone soil would be a useless waste of money.

Wheat requires help in obtaining its nitrogen; a wheat crop will starve for want of nitrogen, while an adjoining corn crop will not suffer. Wheat has strong power of obtaining potash from the soil, while clover has very little, and corn needs help in obtaining its phosphoric acid. Hence a judicious use of fertilizer would be nitrogen for wheat, potash for clover, and phosphate for corn. It was formerly believed that all that was necessary to determine the needs of a soil was a chemical analysis. But this has been proven to be untrue.

As before stated, the fertility of a soil does not depend so much on the amount of plant food contained in it, as upon the availability of this plant food. A chemical analysis does not differentiate between the

available and the insoluble, but determines the total amount of plant food present in the soil.

The only sure way to determine the needs of a soil is to put the land to actual tests. This is done by selecting a small piece of a representative field and dividing it up into small plots of the same area. One or two of these small plots should be planted without the use of any fertilizer whatever, then each of the others should be fertilized with a different plant food or mixture of plant foods.

A vacant strip should be left between the several plots to prevent the plant food from one plot getting over into the other.

In making tests of this kind, it is of great importance that all conditions except that of fertilization should be exactly the same for each of the test plots.

From the way in which the different plots respond, an idea of the needs of the land can be formed. By carrying out a test of this kind covering a period of several years, the farmer can ascertain what elements and treatment are necessary for the permanent building up of his land, and act accordingly.

ADDITIONAL ANALYSES.

Analyses made by the State Chemist, other than those given in the following tables, are as follows:

Fertilizers, 7 samples.

Shale, 1 sample.

Water, 2 samples.

Phosphate rock, 5 samples.

Soils, 6 samples.

Limestones, 2 samples.

CURRENT PRICES.

The following are the approximate current prices for fertilizer materials f. o. b. Nashville:

High-grade ground blood	\$ 3.40 per unit.
Ground fish	3.75 per unit.
High-grade tankage	3.35 epr unit.
Nitrate of soda, 15% nitrogen.....	57.00 per ton.
Cottonseed meal	30.00 per ton.
Sulphate of ammonia	3.20 epr unit.
Ground phosphate rock	5.00 per ton.
Acid phosphate 16%.....	10.00 per ton.
Muriate of potash 50%	45.00 per ton.
Kainit 12%	13.00 per ton.
Sulphate of potash 50%	50.00 per ton.

The valuations given in the following tables are based upon the following prices per pound for the three plant food constituents: Available phosphoric acid, 4 cents; nitrogen, 20 cents; potash, 5 cents.

LIST OF COMPLETE FERTILIZERS—OFFICIAL ANALYSES FOR 1913.

INSPECTOR	BRAND	MANUFACTURER	DEALER	GUARANTEED						FOUND			
				Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value		
328 DeBerry	153 Armour's 11-2-1 ...	Armour's Fert. Works, Nashville, Tenn.	E. R. Nelson, Humboldt, Tenn.	11.00	1.65	1.00	\$16.40	11.00	1.59	2.07	\$17.23		
327 DeBerry	151 Armour's 4-8-4	Armour's Fert. Works, Nashville, Tenn.	E. R. Nelson, Humboldt, Tenn.	8.00	3.30	4.00	23.60	11.75	2.56	2.91	*22.55		
326 DeBerry	150 Armour's Truck Grower	Armour's Fert. Works, Nashville, Tenn.	E. R. Nelson, Humboldt, Tenn.	10.00	3.30	4.00	25.20	11.02	2.81	3.82	*23.87		
325 DeBerry	147 West Tenn. Special Vegetable Grower.	American Agri. Chem. Co., Cincinnati, O. ...	G. P. McCleary, Humboldt, Tenn.	8.00	1.65	2.00	15.00	9.20	1.90	2.23	17.19		
323 DeBerry	144 Cotton Seed Meal ..	Tupelo Oil & Ice Co., Tupelo, Miss.	M. F. Hamilton, Humboldt, Tenn.	2.50	6.60	2.00	30.40	.75	7.10	1.92	30.92		
324 DeBerry	146 Royal H. G. Tobacco Grower ...	Va.-Carolina, Chem. Co., Memphis, Tenn.	M. F. Hamilton, Humboldt, Tenn.	8.00	1.65	5.00	18.00	8.50	1.92	5.47	19.95		
322 DeBerry	143 Ox Crop Producer..	Tennessee Chem. Co., Nashville, Tenn.	S. W. Murphy, Wildersville, Tenn. ...	10.00	.83	3.00	14.32	11.20	.73	2.89	14.77		
321 DeBerry	142 Triangle Fish, Nitrogen, Bone, Potash Grower	International Agri. Cor., Nashville, Tenn.	J. C. Peterson, Lexington, Tenn.	8.00	1.65	4.00	17.00	8.87	1.60	3.82	17.31		
320 DeBerry	139 Globe Wheat Grower	Globe Fert. Co., Nashville, Tenn.	J. M. & F. M. Shepherd, Lexington, Tenn.	10.00	1.65	2.00	16.60	11.45	1.64	2.05	17.77		
319 DeBerry	138 Liberty Special	International Agri. Cor., Nashville, Tenn.	J. M. & M. F. Shepherd, Lexington, Tenn.	10.00	1.65	2.00	16.60	9.15	1.88	2.81	17.65		
318 DeBerry	137 Eagle Cotton & Wheat Grower ...	Globe Fert. Co., Nashville, Tenn.	J. M. & M. F. Shepherd, Lexington, Tenn.	8.00	1.65	2.00	15.00	8.00	1.66	2.04	15.98		

317	DeBerry	132	Farmers' Vegetable Manure	Read Phosphate Co., Nashville, Tenn.	Bowles Hardware Co., Camden, Tenn.	Good	10.00	.82	3.00	14.28	9.65	.93	2.80	14.24
316	DeBerry	130	H. G. Ammoniated Dissolved Bone	Read Phosphate Co., Nashville, Tenn.	Bowles Hardware Co., Camden, Tenn.	Good	10.00	1.65	2.00	16.60	10.45	1.92	1.63	17.67
315	DeBerry	128	Special Wheat & Corn Grower	Globe Fert. Co., Nashville, Tenn.	Ira Presson, Camden, Tenn.	Good	12.00	.82	1.00	13.88	13.52	.95	1.38	15.99
314	DeBerry	127	Braden's Formula	Globe Fert. Co., Nashville, Tenn.	Ira Presson, Camden, Tenn.	Good	11.00	.83	3.00	15.12	11.70	.97	3.34	16.58
313	DeBerry	125	Northwestern H. G. Ky. Tob. Grower	American Agri. Chem. Co., Cincinnati, O.	Currier & Sons, Paris, Tenn.	Good	8.00	1.65	2.00	15.00	9.20	1.85	2.53	17.23
312	DeBerry	123	Globe Truck Grower	Globe Fert. Co., Nashville, Tenn.	D. E. Bomar, Paris, Tenn.	Good	8.00	.41	8.00	16.04	10.00	1.11	5.45	17.89
311	DeBerry	120	Universal Crop & Tobacco Grower	Globe Fert. Co., Nashville, Tenn.	D. E. Bomar, Paris, Tenn.	Good	8.00	.82	4.00	13.68	9.00	1.29	4.01	16.37
310	DeBerry	119	Scott's Gossypium Phospho	Va.-Carolina Chem. Co., Memphis, Tenn.	J. L. Morgan, Gibson, Tenn.	Good	10.00	1.65	2.00	16.60	10.37	1.85	1.98	17.67
309	DeBerry	118	Dixie H. G. Guano	Va.-Carolina Chem. Co., Memphis, Tenn.	J. L. Morgan, Gibson, Tenn.	Good	9.00	2.47	3.00	20.08	9.58	1.66	4.38	*18.68
308	DeBerry	116	Gold Seal Fer- tilizer	Southern Cotton Oil Co., Memphis, Tenn.	Duffy & Stallings, Humboldt, Tenn.	Good	10.00	3.30	4.00	25.20	9.90	3.17	3.99	24.54
307	DeBerry	115	Tobacco Grower	Southern Cotton Oil Co., Memphis, Tenn.	Duffy & Stallings, Humboldt, Tenn.	Good	8.00	1.65	5.00	18.00	8.08	1.70	4.67	17.95
306	DeBerry	113	H. G. Royal Tobacco Grower	Va.-Carolina Chem. Co., Memphis, Tenn.	M. F. Hamilton, Humboldt, Tenn.	Good	8.00	1.65	2.00	15.00	7.43	2.08	4.54	18.89
305	DeBerry	111	King Cotton Grower	International Agri. Cor., Nashville, Tenn.	W. F. Smith, Big Sandy, Tenn.	Good	10.00	.83	1.00	12.32	15.89	1.12	1.95	19.14
304	DeBerry	110	Gen. Lee Cotton Grower	Mt. Pleasant Fert. Co., Tenn.	W. T. Pofford, Big Sandy, Tenn.	Good	11.00	1.65	1.00	16.40	10.55	2.05	.93	17.57
303	DeBerry	109	Great Southern Su- perior Corn & Cot- ton Grower	Mt. Pleasant Fert. Co., Tenn.	W. T. Pofford, Big Sandy, Tenn.	Good	10.00	.82	1.00	12.28	12.00	.86	1.08	14.12
302	DeBerry	108	Empire Cotton & Corn Grower	Empire Carbon Works, St. Louis, Mo.	A Frazier, Big Sandy, Tenn.	Good	8.00	1.65	2.00	15.00	8.88	2.01	2.16	17.34

LIST OF COMPLETE FERTILIZERS—OFFICIAL ANALYSES FOR 1913—Continued.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED			FOUND				
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value
301 DeBerry	107 Old Hickory Guano.	International Agri. Cor., Nashville, Tenn.	W. F. Dowdy, Big Sandy, Tenn.	Good	8.00	1.65	2.00	15.00	8.95	1.73	2.89	16.97
300 DeBerry	105 Old Hickory Tobacco Grower	International Agri. Cor., Nashville, Tenn.	W. F. Dowdy, Big Sandy, Tenn.	Good	10.00	1.65	2.00	16.60	10.18	1.70	2.43	17.37
299 DeBerry	106 Old Hickory Blood & Bone	International Agri. Cor., Nashville, Tenn.	W. F. Dowdy, Big Sandy, Tenn.	Good	10.00	.82	1.00	12.28	10.80	.79	1.13	12.93
297 DeBerry	99 Read's Ready Potato Grower	Read Phosphate Co., Nashville, Tenn.	Nelson & Stallings, Humboldt, Tenn.	Good	8.00	1.65	10.00	23.00	8.75	1.80	8.30	22.50
296 DeBerry	96 Old Hickory Cotton Grower	International Agri. Cor., Nashville, Tenn.	J. E. Outlaw, Henderson, Tenn. ...	Good	10.00	1.65	2.00	16.66	10.18	1.83	2.20	17.66
295 DeBerry	92 Ox Boll Producer ..	Tennessee Chem. Co., Nashville, Tenn.	W. F. Rosey, Henderson, Tenn.	Good	11.00	1.65	1.00	16.40	11.15	1.80	1.23	17.35
294 DeBerry	84 Ammoniated Fertilizer	Va.-Carolina Chem. Co., Memphis, Tenn.	W. T. Ingram, Bolivar, Tenn.	Fair	10.00	.82	3.00	14.28	11.05	.91	2.99	15.47
293 DeBerry	83 Royal Vegetable Grower	Va.-Carolina Chem. Co., Memphis, Tenn.	W. T. Ingram, Bolivar, Tenn.	Good	8.00	2.47	4.00	20.28	8.70	2.56	3.57	20.77
292 DeBerry	82 Ox H. G. Ammoniated Bone	Tennessee Chem. Co., Nashville, Tenn.	Nuckolls Bros., Toone, Tenn.	Good	10.00	1.65	2.00	16.60	10.60	1.71	2.12	17.44
291 DeBerry	80 Ox Ammoniated Alkaline Bone ...	Tennessee Chem. Co., Nashville, Tenn.	Nuckolls Bros., Toone, Tenn.	Good	10.00	.82	1.00	12.28	10.25	.91	1.43	13.27
290 DeBerry	78 Black Patch Tobacco Grower	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. ...	Littleton & Bumpass, Puryear, Tenn.	Good	8.00	.82	4.00	13.68	10.70	1.05	3.82	16.58

289	DeBerry	.....	71 Watson's Cotton Special	International Agri. Cor., Nashville, Tenn.	Watson & Watson, Huntingdon, Tenn. ...	Good	8.00	1.65	2.00	15.00	8.62	2.01	2.75	17.68
288	DeBerry	.....	68 Triangle Fish Trucker	International Agri. Cor., Nashville, Tenn.	Watson & Watson, Huntingdon, Tenn. ...	Good	8.00	2.47	6.00	22.28	8.42	2.26	5.62	21.29
287	DeBerry	.....	67 Tiger Corn Grower.	International Agri. Cor., Nashville, Tenn.	Watson & Watson, Huntingdon, Tenn. ...	Good	10.00	.83	1.00	12.32	10.75	1.07	1.24	14.12
286	DeBerry	.....	64 Acme Guano	Southern Cotton Oil Co., Memphis, Tenn.	Watson & Watson, Huntingdon, Tenn. ...	Good	10.00	.82	3.00	14.28	10.17	1.15	2.37	15.10
285	DeBerry	.....	63 Southern Cotton Hustler	Southern Cotton Oil Co., Memphis, Tenn.	Watson & Watson, Huntingdon, Tenn. ...	Good	8.35	1.65	2.00	15.28	8.67	1.77	2.07	16.08
284	DeBerry	.....	62 H. G. Cotton Belt Fertilizer	Tupelo Fert. Co., Tupelo, Miss.	W. L. Yancey, Trezevant, Tenn.	Good	10.00	1.65	4.00	18.60	10.40	1.76	3.90	19.20
283	DeBerry	.....	59 V-3-C Fruit & Truck Special	Va.-Carolina Chem. Co., Memphis, Tenn.	H. L. Fly, Tenn.	Good	6.00	3.30	8.00	26.00	6.87	3.02	9.60	27.17
282	DeBerry	.....	57 Blood & Bone Guano	International Agri. Cor., Nashville, Tenn.	A. J. Maness, Finger, Tenn.	Good	10.00	.83	1.00	12.32	10.85	.80	1.47	13.35
281	DeBerry	.....	58 Bone & Tobacco Special	Federal Chemical Co., Nashville, Tenn.	A. J. Maness, Finger, Tenn.	Good	10.00	.20	2.00	10.80	10.00	.72	1.61	12.41
280	DeBerry	.....	51 Old Hickory H. G. Vegetable Grower.	National Fert. Co., Nashville, Tenn.	Hicks Lawrence Com. Co., Jackson, Tenn. ...	Good	10.00	3.30	4.00	25.20	10.73	3.09	4.73	25.67
279	DeBerry	.....	56 Daybreak Favorite.	Federal Chemical Co., Nashville, Tenn.	A. J. Maness, Finger, Tenn.	Good	11.00	.82	3.00	15.08	10.83	1.01	3.10	15.80
278	DeBerry	.....	54 Old Hickory H. G. Vegetable Grower.	International Agri. Cor., Nashville, Tenn.	Hicks Lawrence Com. Co., Jackson, Tenn. ...	Good	8.00	3.30	4.00	23.60	8.48	3.27	4.90	24.76
277	DeBerry	.....	53 Hicks Lawrence Potato Grower	International Agri. Cor., Nashville, Tenn.	Hicks Lawrence Com. Co., Jackson, Tenn. ...	Good	8.00	1.65	10.00	23.00	8.52	1.57	9.50	22.59
276	DeBerry	.....	52 Ox Special Guano	Tennessee Chem. Co., Nashville, Tenn.	Hicks Lawrence Com. Co., Jackson, Tenn. ...	Good	8.00	1.65	10.00	23.00	8.40	1.63	9.42	22.66
275	DeBerry	.....	49 Royal Blood, Bone & Potash	Va.-Carolina Chem. Co., Memphis, Tenn.	Hicks Lawrence Com. Co., Jackson, Tenn. ...	Good	10.00	.82	1.00	12.28	10.95	1.15	1.67	15.93
274	DeBerry	.....	48 Royal Cotton Boll Guano	Va.-Carolina Chem. Co., Memphis, Tenn.	Hicks Lawrence Com. Co., Jackson, Tenn. ...	Good	8.35	1.65	2.00	15.28	8.65	1.67	1.85	15.45

LIST OF COMPLETE FERTILIZERS—OFFICIAL ANALYSES FOR 1913—Continued.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED				FOUND			
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value
273 DeBerry	47 Ox Cotton Grower	Tennessee Chem. Co., Nashville, Tenn.	Hicks Lawrence Com. Co., Jackson, Tenn. ...	Good	10.00	.82	3.00	14.28	9.40	1.10	4.29	16.21
272 DeBerry	46 Fox Vegetable Grower	Fox Chemical Co., Nashville, Tenn.	Farmers' Supply Co., Whiteville, Tenn.	Good	8.00	1.65	5.00	18.00	8.70	1.50	3.82	*16.78
271 DeBerry	45 Fox Cotton King ..	Fox Chemical Co., Nashville, Tenn.	Farmers' Supply Co., Whiteville, Tenn.	Good	10.00	.82	2.00	13.28	9.80	.83	1.94	13.10
270 DeBerry	44 Scott's State Standard Guano	Va.-Carolina Chem. Co., Memphis, Tenn.	Brown Bros., Lexington, Tenn.	Good	8.35	1.65	2.00	15.28	9.50	1.74	1.74	16.30
269 DeBerry	43 Triangle Fish Guano	International Agri. Cor., Nashville, Tenn.	J. C. Peterson, Lexington, Tenn. ...	Good	10.00	1.65	2.00	16.60	10.85	1.46	2.38	16.90
268 DeBerry	42 Triangle Fish Corn Grower	International Agri. Cor., Nashville, Tenn.	J. C. Peterson, Lexington, Tenn. ...	Good	8.00	1.65	2.00	15.00	8.90	1.74	2.38	16.46
267 DeBerry	38 Good Luck Crop Grower	Globe Fert. Co., Nashville, Tenn.	J. C. Peterson, Lexington, Tenn. ...	Good	11.00	.41	2.50	12.94	10.85	.52	2.50	13.26
266 DeBerry	37 Tennessee Cotton Grower	Globe Fert. Co., Nashville, Tenn.	J. C. Peterson, Lexington, Tenn. ...	Good	10.00	.82	2.00	13.28	11.35	.98	2.06	15.04
265 DeBerry	36 Cotton Belt H. G. Fertilizer	Tupelo Fert. Co., Tupelo, Miss.	Montgomery Ward & Co., Lexington, Tenn.	Good	10.00	.83	3.00	14.32	9.60	1.43	2.00	15.40
264 DeBerry	34 Forked Deer Early Riser	Tenn. Cotton Oil Co., Jackson, Tenn. ....	..... Parsons, Tenn.	Good	8.00	1.65	2.00	15.00	10.35	2.25	1.09	18.37
263 DeBerry	33 Forked Deer Gold Bond	Tenn. Cotton Oil Co., Jackson, Tenn. ....	..... Parsons, Tenn.	Good	8.00	1.65	2.00	15.00	8.95	1.53	2.18	15.46

262	DeBerry	.....	29 Big Success Cotton Grower	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	J. W. Smith, J. Parsons, Tenn.	Good	10.00	1.65	2.00	16.60	10.30	1.17	2.11	*15.03
261	DeBerry	.....	27 F. D. Grain Ele- vator	Tenn. Cotton Oil Co., Jackson, Tenn.	J. H. Todd, Henderson, Tenn. ...	Good	10.00	.82	1.00	12.28	10.20	.95	1.06	13.02
260	DeBerry	.....	26 F. D. H. G.	Tenn. Cotton Oil Co., Jackson, Tenn.	J. H. Todd, Henderson, Tenn. ...	Good	10.00	1.65	2.00	16.60	10.25	1.91	1.65	17.49
259	DeBerry	.....	25 Forked Deer Rich- land Fertilizer ...	Tenn. Cotton Oil Co., Jackson, Tenn.	J. H. Todd, Henderson, Tenn. ...	Good	8.00	1.65	2.00	15.00	8.00	1.68	2.48	15.60
258	DeBerry	.....	24 H. G. Cotton Belt Fertilizer	Tupelo Fert. Co., Tupelo, Miss.	J. H. Davidson, Henderson, Tenn. ...	Good	10.00	2.50	3.00	21.00	10.05	2.91	3.06	22.74
257	DeBerry	.....	23 Standard H. G. Cot- ton Belt Fertilizer	Tupelo Fert. Co., Tupelo, Miss.	J. H. Davidson, Henderson, Tenn. ...	Good	8.00	1.65	2.00	15.00	8.80	1.57	2.04	15.36
255	DeBerry	.....	21 High Cotton Belt Fertilizer	Tupelo Fert. Co., Tupelo, Miss.	H. P. Wilson, Gadsden, Tenn.	Damp	10.00	1.65	2.00	16.60	9.95	1.67	2.07	16.71
256	DeBerry	.....	22 H. G. Cotton Belt Fertilizer	Tupelo Fert. Co., Tupelo, Miss.	H. P. Wilson, Gadsden, Tenn.	Good	10.00	3.30	4.00	25.20	10.97	3.26	4.60	26.41
254	DeBerry	.....	19 Ox Vegetable Guano	Tennessee Chem. Co., Nashville, Tenn.	J. B. Wallace, Gadsden, Tenn.	Good	8.00	1.65	2.00	15.00	7.88	1.71	3.21	16.35
253	DeBerry	.....	17 Globe Vegetable Manure	Globe Fert. Co., Nashville, Tenn.	J. L. Morgan, Gibson, Tenn.	Good	8.00	1.65	5.00	18.00	8.30	1.84	4.50	18.50
252	DeBerry	.....	16 Read's 10-4-4	Read Phosphate Co., Nashville, Tenn.	B. H. Duggan, Gibson, Tenn.	Good	10.00	3.30	4.00	25.20	10.73	3.34	4.17	26.11
251	DeBerry	.....	15 Read's H. G. To- mato Grower	Read Phosphate Co., Nashville, Tenn.	B. H. Duggan, Gibson, Tenn.	Good	8.00	3.30	4.00	23.60	8.70	3.14	3.93	23.46
250	DeBerry	.....	13 Warmath's Tomato Grower	National Fert. Co., Nashville, Tenn.	J. T. Warmath, Gibson, Tenn.	Good	8.00	3.30	4.00	23.60	8.70	2.89	4.16	*22.68
249	DeBerry	.....	12 Tomato Grower ...	Tuscarora Fert. Co., Nashville, Tenn.	Hale & Dungen, Gibson, Tenn.	Good	8.00	3.30	4.00	23.60	9.45	2.92	3.72	22.96
248	DeBerry	.....	10 Armour's All-Soluble Fertilizer	Armour's Fert. Works, Nashville, Tenn.	H. B. Bradbury, Medina, Tenn.	Good	8.00	2.89	4.00	21.90	8.15	2.64	4.01	21.09
247	DeBerry	.....	8 Forked Deer Early Vegetable Grower	Tenn. Cotton Oil Co., Jackson, Tenn.	R. M. Hemphill, Medina, Tenn.	Good	8.00	3.29	4.00	23.56	8.95	2.75	4.61	22.77

LIST OF COMPLETE FERTILIZERS—OFFICIAL ANALYSES FOR 1913—Continued.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED			FOUND				
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value
246 DeBerry	7 Forked Vegetable Grower	Tenn. Cotton Oil Co., Jackson, Tenn.	R. M. Hemphill, Medina, Tenn.	Good	10.00	3.29	4.00	25.16	10.55	3.30	4.39	26.03
245 DeBerry	5 Royal Fruit Grower	Va.-Carolina Chem. Co., Memphis, Tenn.	H. F. Hamilton, Humboldt, Tenn.	Good	8.00	2.47	5.00	21.28	9.50	2.64	5.08	23.24
244 DeBerry	3 Ox Truck Guano	Tennessee Chem. Co., Nashville, Tenn.	L. C. James, Gibson, Tenn.	Good	10.00	3.30	4.00	25.20	8.50	2.85	4.76	*22.96
243 DeBerry	2 Memphis Truck Special	Va.-Carolina Chem. Co., Memphis, Tenn.	M. F. Hamilton, Humboldt, Tenn.	Good	8.00	3.30	4.00	23.60	9.08	3.16	4.13	24.03
242 DeBerry	1 Potato Grower	Globe Fert. Co., Nashville, Tenn.	J. L. Morgan, Gibson, Tenn.	Good	8.00	3.29	4.00	23.56	8.40	2.86	4.56	22.72
238 DeBerry	103 Best By Test	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	W. P. Brisentine, Whitlock, Tenn.	Good	12.00	1.65	6.00	22.20	11.26	1.46	4.21	19.05
241 Reynolds	117 Eagle H. G. Guano	Swift Fert. Works, Atlanta, Ga.	Lowe Hord Hdwe. Co., Knoxville, Tenn.	Good	10.00	1.65	2.00	16.60	3.90	2.05	1.90	18.02
240 Reynolds	115 Swift's Corn Special H. G. Guano	Swift Fert. Works, Atlanta, Ga.	Lowe Hord Hdwe. Co., Knoxville, Tenn.	Good	10.00	.82	3.00	14.28	10.47	1.56	4.27	18.88
239 Reynolds	118 Chickamauga Bone, Blood & Tankage.	Chickamauga Fert. W., Chattanooga, Tenn.	Wright Hdwe. Co., Knoxville, Tenn.	Good	8.00	.82	2.00	11.68	9.10	1.05	1.59	13.97
237 Reynolds	113 Adair's Ammoniated Dissolved Bone	Adair & McCarty Bros., Chattanooga, Tenn.	Baldwin Imp. & Feed Co., Johnson City	Good	18.00	1.65	2.00	15.00	6.63	1.60	2.86	14.56
236 Reynolds	112 Coweta Standard Grade Animal Bone	Coweta Fert. Co., Newnan, Ga.	Farmer's Exchange, Johnson City, Tenn.	Good	8.35	1.65	2.00	15.28	8.10	1.54	2.75	15.39
238 Reynolds	110 Coweta H. G. Excel-sior Guano	Coweta Fert. Co., Newnan, Ga.	Farmer's Exchange, Johnson City, Tenn.	Good	10.00	3.30	4.00	25.20	13.10	2.18	2.81	*22.01

235	Reynolds	....	108	Empire Blood & Bone Potash	.....	Empire Guano Co., Nashville, Tenn.	Linbeck Supply Co., Elizabethton, Tenn.	Good	8.00	1.65	2.00	15.00	7.85	1.08	2.89	*13.49
234	Reynolds	....	99	Tuscarora Wheat Grower	.....	Tuscarora Fert. Co., Nashville, Tenn.	G. F. Lockmiller, Athens, Tenn.	Good	9.00	.82	2.00	12.48	10.17	1.01	2.42	14.59
233	Reynolds	....	95	McCarty's Cotton Special	.....	Adair & McCarty Bros., Chattanooga, Tenn.	Bayless Hdw. Co., Athens, Tenn.	Good	10.00	.82	3.00	14.28	12.05	.81	3.82	16.70
232	Reynolds	....	93	Adair's Soluble Pacific Guano	.....	Adair & McCarty Bros., Chattanooga, Tenn.	Bayless Hdw. Co., Athens, Tenn.	Good	10.00	1.65	2.00	16.60	10.85	1.63	2.47	17.67
231	Reynolds	....	85	Armour's Blood & Potash Compound	.....	Armour's Fert. Works, Nashville, Tenn.	Lowe Hord Hdw. Co., Knoxville, Tenn.	Fair	10.00	1.65	4.00	18.60	10.00	1.80	3.24	18.44
230	Reynolds	....	83	Armour's Blood & Bone Special	.....	Armour's Fert. Works, Nashville, Tenn.	Lowe Hord Hdw. Co., Knoxville, Tenn.	Good	10.00	.82	3.00	14.28	11.00	.95	3.37	15.97
229	Reynolds	....	75	Eagle Brand Ammoniated Bone	.....	Louisville Fert. Co., Louisville, Ky.	J. M. Ward, Jonesboro, Tenn.	Good	8.00	1.65	2.00	15.00	8.55	1.09	1.78	*12.98
228	Reynolds	....	69	Ox Brand Tobacco Grower	.....	Tennessee Chem. Co., Nashville, Tenn.	W. M. Lee & Co., Jonesboro, Tenn.	Good	8.00	1.65	4.00	17.00	10.05	1.19	4.54	17.34
227	Reynolds	....	67	Bone & Blood Mixture	.....	Hackney, Broyles & Lackey, Knoxville ...	G. McHenderson, Rutledge, Tenn.	Good	5.00	3.35	5.00	22.40	3.75	5.16	5.07	28.71
286	Reynolds	....	64	Fish Brand Kenne-saw Guano	.....	Va.-Carolina Chem. Co., Atlanta, Ga.	J. B. King, Greeneville, Tenn.	Good	8.00	.82	4.00	13.68	12.13	.34	4.30	15.36
225	Reynolds	....	63	Rome Std. Tenn. Potash Guano	....	Rome Chem. Co., Atlanta, Ga.	J. B. King, Greeneville, Tenn.	Good	8.00	2.06	3.00	17.64	9.03	2.29	3.70	20.08
224	Reynolds	....	62	Rome Standard Tobacco Grower	....	Rome Chem. Co., Atlanta, Ga.	J. B. King, Greeneville, Tenn.	Good	8.35	1.65	2.00	15.28	9.68	1.90	2.11	17.45
223	Reynolds	....	54	Coweta H. G. Fertilizer	.....	Coweta Fert. Co., Newnan, Ga.	E. A. Tarbett, Piney Flats, Tenn.	Wet	10.00	1.65	2.00	16.60	11.63	1.68	2.02	18.04
222	Reynolds	....	52	Furman's Extraordinary	.....	Furman's Farm Imp. Co., Atlanta, Ga.	Farmer's Exchange, Johnson City, Tenn. ...	Good	10.00	3.30	4.00	25.20	10.60	3.13	4.38	25.38
221	Reynolds	....	51	Special Vegetable Grower Fertilizer	.....	Furman's Farm Imp. Co., Atlanta, Ga.	Farmer's Exchange, Johnson City, Tenn. ...	Good	8.00	1.65	6.00	19.00	9.75	1.52	5.27	19.15
220	Reynolds	....	50	Farmer's Favorite	....	Read Phosphate Co., Nashville, Tenn.	J. M. Ward, Jonesboro, Tenn.	Good	9.00	.82	2.00	12.48	9.15	.88	1.88	12.72

LIST OF COMPLETE FERTILIZERS—OFFICIAL ANALYSES FOR 1913—Continued.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED			FOUND				
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value
219 Reynolds	41 H. G. Tobacco Special	Read Phosphate Co., Nashville, Tenn.	Rogan Son & Nice, Rogersville, Tenn. ...	Good	8.00	1.65	8.00	21.00	8.30	1.64	8.40	21.60
218 Reynolds	39 Special Vegetable Grower	Furman's Farm Imp. Co., Atlanta, Ga.	Crawford & Caldwell, Maryville, Tenn.	Good	8.00	2.00	6.00	20.40	9.10	1.61	6.88	20.60
217 Reynolds	35 Farmer's Special	Swift & Co., Atlanta, Ga.	R. G. McNutt Hdwe. Co., Maryville, Tenn.	Good	10.00	4.00	4.00	28.00	11.95	2.96	4.61	*26.01
216 Reynolds	32 Special Ammonia Guano	Swift & Co., Atlanta, Ga.	R. G. McNutt Hdwe. Co., Maryville, Tenn.	Good	9.00	1.00	2.00	13.20	11.05	1.02	2.38	15.30
215 Reynolds	30 Supreme	Morris Fert. Co., Atlanta, Ga.	Hall Bros. Co., Cleveland, Tenn.	Good	8.00	1.65	2.00	15.00	9.23	1.66	1.79	15.81
214 Reynolds	29 Supreme	Morris Fert. Co., Atlanta, Ga.	Hall Bros. Co., Cleveland, Tenn.	Good	10.00	1.65	4.00	18.60	10.15	1.72	3.20	18.24
369 Reynolds	165 Three Link	International Agri. Cor., Florence, Ala.	Knoxville Imp. & Mach. Co., Knoxville, Tenn..	Good	10.00	1.65	2.00	16.60	10.33	1.39	2.07	15.89
368 Reynolds	164 Cotton Special	Chickamauga Fert. Co., Chattanooga, Tenn. ..	J. M. Lockmiller, Riceville, Tenn.	Good	10.00	.82	3.00	14.28	10.08	.90	2.64	14.30
366 Reynolds	161 Truck Farmer's Friend	E. W. Scholze, Chattanooga, Tenn. ..	M. L. Beard, Cleveland, Tenn.	Good	10.00	1.65	4.00	18.60	11.90	1.73	3.28	19.72
365 Reynolds	159 Bear Beef, Blood & Bone	Continental Fert. Co., Nashville, Tenn.	D. R. Mayo, Knoxville, Tenn.	Good	10.00	1.65	2.00	16.60	11.15	1.28	2.03	16.07
364 Reynolds	158 Complete Guano	Continental Fert. Co., Nashville, Tenn.	D. R. Mayo, Knoxville, Tenn.	Good	8.00	1.65	2.00	15.00	9.35	1.43	2.02	15.22

363	Reynolds	151	Blood & Potash Composition	Louisville Fert. Co., Louisville, Ky.	Stokeley Bros. Co., Newport, Tenn.	Good	10.00	1.65	4.00	18.50	8.88	1.22	2.25	*14.35
362	Reynolds	149	Vegetable Grower H. G. Guano	Swift Fert. Works, Atlanta, Ga.	B. G. Clark, White Pine, Tenn.	Good	8.00	1.65	7.00	20.00	9.85	1.92	5.94	21.50
361	Reynolds	148	Wheat & Corn Manure	Fox Chem. Co., Louisville, Ky.	B. G. Clark, White Pine, Tenn.	Good	8.00	1.65	2.00	15.00	8.70	1.74	1.98	15.30
360	Reynolds	143	Hiwassee 8-2-2	Hiwassee Guano Co., Atlanta, Ga.	Farmer's Union Co., Jonesboro, Tenn.	Good	8.00	1.65	2.00	15.00	8.55	1.88	2.33	16.69
359	Reynolds	138	Tuscarora 10-6	Tuscarora Fert. Co., Nashville, Tenn.	M. S. Roberts & Son, Greeneville, Tenn.	Good	10.00	1.65	6.00	20.60	10.28	1.68	5.56	20.50
358	Reynolds	135	Victor H. G. Blood & Bone	Victor Guano Co., Atlanta, Ga.	M. S. Roberts & Son, Greeneville, Tenn.	Good	10.00	1.65	6.00	20.60	9.90	1.66	6.01	20.57
357	Reynolds	124	Superior H. G. Meal Guano	Rome Chemical Co., Atlanta, Ga.	J. B. King, Greeneville, Tenn.	Damp	10.00	1.65	4.00	18.60	7.55	1.97	3.24	17.15
356	Reynolds	132	Tuscarora Special Tobacco	Tuscarora Fert. Co., Nashville, Tenn.	M. S. Roberts & Son, Greeneville, Tenn.	Good	8.00	2.46	10.00	26.24	8.50	2.29	9.66	25.62
355	Reynolds	131	Tuscarora Tobacco, No. 285	Tuscarora Fert. Co., Nashville, Tenn.	M. S. Roberts & Son, Greeneville, Tenn.	Good	8.00	1.65	5.00	18.00	8.40	1.56	4.56	17.52
354	Reynolds	128	Victor Standard To- bacco Grower	Victor Guano Co., Nashville, Tenn.	M. S. Roberts & Son, Greeneville, Tenn.	Good	8.00	1.65	2.00	15.00	7.75	1.71	2.50	17.54
353	Reynolds	127	Special H. G. Guano.	Victor Guano Co., Nashville, Tenn.	M. S. Roberts & Son, Greeneville, Tenn.	Good	10.00	2.47	3.00	20.88	10.63	2.60	3.10	22.00
352	Reynolds	126	Liberty Cotton Seed Bone Meal	International Agri. Cor., Florence, Ala.	Farmer's Union, Greeneville, Tenn.	Good	8.00	1.65	2.00	15.00	9.10	1.40	2.40	15.25
313	Tomlinson	77	Fox Special Tobacco Grower	Fox Chem. Co., Louisville, Ky.	J. A. Long & Co., Springfield, Tenn.	Good	8.00	1.65	5.00	18.00	9.30	1.77	4.73	19.25
312	Tomlinson	153	Triangle Grain Grower	International Agri. Cor., Nashville, Tenn.	Ashland City Hdwe. Co., Ashland City, Tenn.	Good	10.00	.83	3.00	14.32	11.70	.95	3.37	16.53
311	Tomlinson	152	Extra Special To- bacco Grower	Tennessee Chem. Co., Nashville, Tenn.	Ashland City Hdwe. Co., Ashland City, Tenn.	Good	8.00	1.65	8.00	21.00	8.45	1.56	7.73	20.73
210	Tomlinson	151	Tenn. & Ky. Tobacco Grower	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Dibble & Edwards, Clarksville, Tenn.	Good	8.00	1.65	4.00	17.00	10.45	1.24	5.33	18.65

196	Tomlinson	...	132	Read's Corn & Wheat Grower ...	Read Phosphate Co., Nashville, Tenn.	J. L. Quarles, Crossville, Tenn.	Good	11.00	.41	1.00	11.44	10.70	.77	.94	12.58
195	Tomlinson	...	129	K. & T. Special Manure	American Agri. Chem. Co., Cincinnati, O. ...	J. L. Quarles, Crossville, Tenn.	Good	8.00	2.47	5.00	21.28	10.35	2.95	7.31	27.39
194	Tomlinson	...	131	Read's Truck Fertilizer	Read Phosphate Co., Nashville, Tenn.	J. L. Quarles, Crossville, Tenn.	Good	7.00	2.47	5.00	20.48	7.90	2.47	4.48	20.68
193	Tomlinson	...	128	Ox Brand Blood & Potash Compound.	Tennessee Chem. Co., Nashville, Tenn.	J. S. Barnes, Tullahoma, Tenn. ...	Good	10.00	1.65	4.00	18.60	8.95	1.94	3.82	18.74
192	Tomlinson	...	123	Great Southern Garden Special	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. ...	Roberson & Johnson, Tullahoma, Tenn. ...	Good	10.00	3.29	5.00	26.16	11.30	3.43	4.92	27.68
191	Tomlinson	...	122	Ox Brand Tobacco, No. 8-2-6	Tennessee Chem. Co., Nashville, Tenn.	J. S. Barnes, Tullahoma, Tenn. ...	Good	8.00	1.65	6.00	19.00	8.55	1.57	6.44	19.56
190	Tomlinson	...	119	Monarch	International Agri. Cor., Florence, Ala.	H. O. Wood, McMinnville, Tenn. ...	Good	8.00	1.65	2.00	15.00	9.25	1.54	2.49	16.05
189	Tomlinson	...	117	Buffalo Bone Fertilizer	Furman Farm Imp. Co., Atlanta, Ga.	Biles Smith Hdwe. Co., McMinnville, Tenn. ...	Good	8.00	1.65	2.00	15.00	9.06	1.67	2.21	16.13
188	Tomlinson	...	113	H. G. Tobacco Grower No. 4	Taylor & Powell Fert. Co., Kinney, Tenn. ...	Taylor & Powell, Springfield, Tenn. ...	Good	8.00	2.07	4.00	18.68	10.05	2.16	4.29	20.97
187	Tomlinson	...	110	Special Tobacco Grower	Federal Chem. Co., Louisville, Ky.	Matthews & Murphy, Springfield, Tenn. ...	Good	8.00	1.23	6.00	17.32	9.38	1.03	6.76	18.38
186	Tomlinson	...	107	Standard Crop & Tobacco Grower ..	Federal Chem. Co., Louisville, Ky.	Matthews & Murphy, Springfield, Tenn. ...	Good	8.00	.82	4.00	13.68	9.10	.81	4.85	15.37
185	Tomlinson	...	105	Ox Brand Slaughter House Bone	Tennessee Chem. Co., Nashville, Tenn.	Spain & Hudson, Murfreesboro, Tenn...	Good	8.00	1.65	2.00	15.00	8.50	1.60	1.91	15.11
184	Tomlinson	...	101	Read's Diamond Special	Read Phosphate Co., Nashville, Tenn.	R. F. Overall & Co., Murfreesboro, Tenn...	Good	10.00	2.47	3.00	20.88	9.38	2.00	3.04	18.54
183	Tomlinson	...	85	Ox Special Guano ..	Tennessee Chem. Co., Nashville, Tenn.	H. Woodward & Dowlen, Springfield, Tenn. ...	Good	10.00	1.65	2.00	16.60	10.60	1.61	2.48	17.40
182	Tomlinson	...	31	Tuscarora Standard.	Tuscarora Fert. Co., Nashville, Tenn.	Kraus Bros., Lawrenceburg, Tenn.	Good	8.00	1.65	2.00	15.00	9.40	1.74	1.82	16.30
181	Tomlinson	...	79	Horse Shoe Brand Corn Grower	American Agri. Chem. Co., Cincinnati, O. ...	W. E. Ryan, Springfield, Tenn. ...	Good	10.00	.82	1.00	12.28	10.18	1.18	1.64	14.50

LIST OF COMPLETE FERTILIZERS—OFFICIAL ANALYSES FOR 1913—Continued.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED					FOUND		
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value
180 Tomlinson ...	74 Baugh's Animal Base Potash Comp.	Baugh & Sons Co., Norfolk, Va.	J. A. Long & Co., Springfield, Tenn. ...	Good	8.00	1.65	2.00	15.00	8.50	1.66	1.98	15.42
179 Tomlinson ...	70 Corn & Wheat Grower	American Agri. Chem. Co., Cincinnati, O. ...	L. F. Bell & Co., Springfield, Tenn. ...	Good	10.00	.82	1.00	12.38	12.00	.93	1.05	14.37
177 Tomlinson ...	56 Lawrence Co. H. G.	Leoma Union Whse. & Mfg. Co., Leoma, Tenn.	G. W. Seisher, St. Joseph, Tenn.	Good	8.00	.82	5.00	14.68	10.85	.94	4.27	16.71
176 Tomlinson ...	21 Vegetable Guano ..	Tennessee Chem. Co., Nashville, Tenn.	Smart Bros. & Willis, Manchester, Tenn. ...	Good	8.00	1.65	5.00	18.00	8.48	1.40	6.30	18.63
175 Tomlinson ...	15 Bear Brand Special Corn Formula ...	Continental Fert. Co., Nashville, Tenn.	W. M. Young, Sparta, Tenn.	Good	10.00	.41	2.00	11.64	8.80	.84	2.41	12.81
174 Tomlinson ...	89 Blood & Bone No. 1	Read Phosphate Co., Nashville, Tenn.	R. F. Overall & Co., Murfreesboro, Tenn. ...	Good	8.00	1.65	2.00	15.00	9.08	1.42	1.53	14.47
173 Tomlinson ...	80 Armour's Bone & Potash Mixture ...	Armour's Fert. Works, Nashville, Tenn.	Holman, Johnson & Co., Springfield, Tenn. ...	Good	22.00	1.62	3.00	27.08	22.05	1.76	5.51	30.19
171 Tomlinson ...	106 Sadler's Formula ...	International Agri. Cor., Nashville, Tenn.	L. D. Harrell, Murfreesboro, Tenn. ...	Good	12.00	.....	2.00	11.60	11.55	.08	1.88	11.44
172 Tomlinson ...	112 Wheat & Corn Special	Federal Chem. Co., Louisville, Ky.	Matthews & Murphy, Springfield, Tenn. ...	Good	11.00	.41	1.00	11.44	10.80	.42	1.14	11.46
170 Tomlinson ...	100 Read's Favorite Cotton Grower	Read Phosphate Co., Nashville, Tenn.	R. F. Overall & Co., Murfreesboro, Tenn. ...	Good	10.00	1.65	2.00	16.60	10.20	1.36	1.94	15.54
169 Tomlinson ...	104 Rutherford High Grade	Farmer's Fert. Co., Murfreesboro, Tenn. ...	Coombs & Harrell, Murfreesboro, Tenn. ...	Good	10.00	1.65	2.00	16.60	11.00	1.88	2.40	18.72

168	Tomlinson	...	114	Grain Special	.....	Taylor & Powell Fert. Co., Klnney, Tenn. ...	Good	12.00	.82	2.00	14.88	12.60	.76	3.43	16.55.
167	Tomlinson	...	108	Potato & Tobacco Grower	.....	Federal Chem. Co., Louisville, Ky.	Good	8.00	1.65	7.50	20.50	9.03	1.12	9.30	21.00.
166	Tomlinson	...	99	Read's Vegetable Fruit & Vine Gro.	.....	Read Phosphate Co., Nashville, Tenn.	Good	8.00	1.65	8.00	21.00	7.75	1.66	7.80	20.64.
165	Tomlinson	...	96	Big Success Corn Special	.....	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. ..	Good	8.00	1.65	2.00	15.00	8.93	1.73	2.42	16.48.
164	Tomlinson	...	91	H. G. Tobacco Grower	.....	The Empire Guano Co., Nashville, Tenn.	Good	8.00	1.65	4.00	17.00	8.70	1.29	5.41	17.53.
163	Tomlinson	...	86	Fertilizer Kotton	..	Huntsville Whse Co., Huntsville, Ala.	Good	10.00	1.65	2.00	16.60	10.06	1.76	3.16	18.24.
162	Tomlinson	...	84	Armour's 8-5-7	.....	Armour's Fert. Works, Nashville, Tenn.	Good	8.00	4.12	7.00	29.88	10.50	2.17	8.03	*25.11
161	Tomlinson	...	83	Armour's Wheat Special Fertilizer.	.....	Armour's Fert. Works, Nashville, Tenn.	Good	10.00	.82	2.00	13.28	10.60	1.00	2.97	15.45.
160	Tomlinson	...	82	Armour's H. G. Po- tato Fertilizer	...	Armour's Fert. Works, Nashville, Tenn.	Good	8.00	1.65	10.00	23.00	8.40	1.45	11.12	23.64
159	Tomlinson	...	78	N. W. Horseshoe Brand Tob. Grower	.....	American Agri. Chem. Co., Cincinnati, O. ...	Good	8.00	1.65	5.00	18.00	7.43	1.97	6.86	20.68
158	Tomlinson	...	81	Armour's 2-10-2	.....	Armour's Fert. Works, Nashville, Tenn.	Good	10.00	1.65	2.00	16.60	10.91	1.76	2.55	18.31
157	Tomlinson	...	75	Baugh's Complete Animal Base Fert.	.....	Baugh & Sons Co., Norfolk, Va.	Good	8.00	1.65	5.00	18.00	9.35	1.63	5.28	19.28
156	Tomlinson	...	69	Homestead Tobacco Grower	.....	American Agri. Chem. Co., Cincinnati, O.	Good	10.00	2.88	3.50	23.02	10.25	2.99	3.76	23.92
155	Tomlinson	...	67	Big Four Tobacco Grower	.....	Globe Fert. Co., Louisville, Ky.	Good	8.00	1.65	2.00	15.00	9.58	1.19	4.38	16.80
154	Tomlinson	...	38	Hoozier Corn Grower	.....	Armour's Fert. Works, Nashville, Tenn.	Good	8.00	.82	4.00	13.68	9.45	.95	3.91	15.27.
153	Tomlinson	...	60	Bone, Blood & Potash	.....	Fox Chem. Co., Louisville, Ky.	Good	11.00	.41	1.00	11.44	11.70	.63	1.59	13.47.

LIST OF COMPLETE FERTILIZERS—OFFICIAL ANALYSES FOR 1913—Continued.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED				FOUND			
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value
152 Tomlinson ...	51 Special Vegetable Grower	Tenn. Valley Fert. Wks., Florence, Ala.	S. H. Massey, Etheridge, Tenn.	Good	8.00	1.65	4.00	17.00	9.95	1.39	3.49	17.01
151 Tomlinson ...	59 Furman's Blood, Bone & Tankage Guano	Furman Farm Imp. Co., Atlanta, Ga.	R. E. Green, St. Joseph, Tenn.	Good	9.00	.82	2.00	12.48	8.55	.97	2.44	13.16
150 Tomlinson ...	53 Corn & Wheat Special	Leoma Union Whse. Mfg. Co., Leoma, Tenn.	J. W. Stisher, J. Leoma, Tenn.	Good	10.00	.....	4.00	12.00	14.70	.....	4.23	15.99
149 Tomlinson ...	50 Big Success Potato Special	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. ..	J. L. Spingle & Son, Etheridge, Tenn.	Good	7.00	2.47	6.00	21.48	9.58	2.56	7.08	24.90
148 Tomlinson ...	47 Progress Corn & Wheat Grower ...	Globe Fert. Co., Louisville, Ky.	Augustine Bros. & Co., Loreto, Tenn.	Good	10.00	.82	2.00	13.28	11.90	.97	2.91	16.31
147 Tomlinson ...	44 Chickamauga Fish Guano, with 4 per Potash	Chickamauga Fert. W., Chattanooga, Tenn. ..	Frank Meiers, Loreto, Tenn.	Good	8.00	.82	4.00	13.68	9.75	1.15	5.19	17.53
146 Tomlinson ...	6 Special	Huntsville Whse. Co., Huntsville, Ala.	W. D. Smith, Manchester, Tenn. ...	Wet	10.00	2.47	3.00	20.88	10.98	2.18	2.66	20.16
145 Tomlinson ...	66 Ky. Standard Tobacco Grower	Globe Fert. Co., Louisville, Ky.	Smith Bros., Dorris Co., Springfield, Tenn.	Good	8.00	1.65	5.00	18.00	10.68	1.19	7.27	20.57
144 Tomlinson ...	41 Chickamauga Comp. Fertilizer	Chickamauga Fert. W., Chattanooga, Tenn. ..	Frank Meiers, Loreto, Tenn.	Good	8.00	1.65	2.00	15.00	8.88	1.95	2.09	16.99
142 Tomlinson ...	37 King Cotton Grower	Armour's Fert. Works, Nashville, Tenn.	Frank Meiers, Loreto, Tenn.	Good	8.00	1.65	2.00	15.00	8.38	1.74	2.64	16.30
143 Tomlinson ...	33 King Cotton Grower	Tenn. Valley Fert. Co., Florence, Ala.	Buchanan Bros., Lawrenceburg, Tenn. ..	Good	10.00	.82	1.00	12.28	11.50	.93	.93	13.85

141	Tomlinson ...	30	Tuscarora 1-12-1 ...	Tuscarora Fert. Co., Nashville, Tenn.	Kraus Bros., Lawrenceburg, Tenn...	Good	12.00	.82	1.00	13.88	12.28	.90	1.22	14.64
140	Tomlinson ...	1	Liberty C. S. Meal & Bone	Florence Cotton Oil Co., Florence, Ala.	W. D. Smith, Manchester, Tenn. ...	Good	8.00	1.65	2.00	15.00	8.50	1.35	2.93	15.13
139	Tomlinson ...	23	Bone Meal	Armour's Fert. Works, Omaha, Neb.	M. Richardson, Lawrenceburg, Tenn...	Good	24.00	2.47	.....	29.08	26.15	2.54	.14	31.22
138	Tomlinson ...	27	Ox Brand Truck Grower	Tennessee Chem. Co., Nashville, Tenn.	M. Richardson, Lawrenceburg, Tenn...	Good	8.00	3.30	4.00	23.60	9.53	3.22	5.66	26.16
137	Tomlinson ...	25	Royal H. G. Guano..	Va.-Carolina Chem. Co., Memphis, Tenn.	M. Richardson, Lawrenceburg, Tenn...	Good	10.00	1.65	2.00	16.60	12.78	1.85	1.74	19.36
136	Tomlinson ...	2	Liberty Wheat Spe- cial	Florence Cotton Oil Co., Florence, Ala.	W. D. Smith, Manchester, Tenn. ...	Good	10.00	.83	3.00	14.32	10.80	.95	3.51	15.95
135	Tomlinson ...	39	Fruit & Root Crop Special	Armour's Fert. Works, Nashville, Tenn.	Frank Meiers, Loretto, Tenn.	Good	8.00	1.65	5.00	18.00	8.30	1.70	6.38	19.82
134	Tomlinson ...	20	Special Truck Guano	Tennessee Chem. Co., Nashville, Tenn.	Everett Hdw. Co., Sparta, Tenn.	Good	10.00	3.30	4.00	25.20	10.00	3.50	5.04	27.04
133	Tomlinson ...	35	Florence Fertilizer.	Tenn. Valley Fert. Co., Florence, Ala.	Buchanan Bros., Lawrenceburg, Tenn...	Good	10.00	1.65	2.00	16.60	12.83	1.33	1.86	17.44
132	Tomlinson ...	13	Bear Brand Vegeta- ble Fertilizer	Continental Fert. Co., Nashville, Tenn.	W. M. Young, Sparta, Tenn.	Good	8.00	1.65	5.00	18.00	8.83	1.59	5.66	13.08
131	Tomlinson ...	32	Tiger Corn Grower.	Tenn. Valley Fert. Co., Florence, Ala.	Buchanan Bros., Lawrenceburg, Tenn...	Good	10.00	.82	1.00	12.28	11.08	1.01	.95	13.85
130	Tomlinson ...	68	Homestead A Bone- Black	American Agri. Chem. Co., Cincinnati, O. ...	L. F. Bell & Co., Springfield, Tenn. ...	Good	8.00	2.06	1.50	16.14	9.80	2.53	2.19	20.35
129	Tomlinson ...	26	Ox Brand Special Wheat & Corn Gro.	Tennessee Chem. Co., Nashville, Tenn.	M. Richardson, Lawrenceburg, Tenn...	Good	12.00	.82	1.00	13.88	12.35	.81	1.42	14.54
128	Tomlinson ...	125	Great So. Tobacco Special	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. ...	Robertson & Johnson, Tulahoma, Tenn.	Good	8.00	1.65	10.00	23.00	9.40	1.39	9.88	22.96
124	Tomlinson ...	126	Great So. Planters' Choice	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. ...	Robertson & Johnson, Tulahoma, Tenn.	Good	10.00	1.65	2.00	16.60	10.43	1.84	2.13	17.83

PHOSPHATE AND POTASH—OFFICIAL ANALYSES FOR 1913.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED				FOUND			
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value
100 DeBerry	31 White as Snow Cotton Special	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. . .	J. W. Smith, Parsons, Tenn.	Good	10.00	.....	4.00	12.00	11.98	.....	2.69	12.27
91 DeBerry	216 N. W. H. G. Bone & Potash	American Agri. Chem. Co., Cincinnati, O. . .	Currier, Paris, Tenn.	Good	10.00	.....	4.00	12.00	11.85	.....	2.29	11.77
90 DeBerry	73 Triangle Fish, Bone & Potash	International Agri. Cor. Nashville, Tenn. . .	Watson & Watson, Huntingdon, Tenn. . .	Good	10.00	.....	4.00	12.00	13.38	.....	3.20	13.90
89 Reynolds	120 Wheat & Corn Grower	Chickamauga Fert. W., Chattanooga, Tenn. . .	Wright Hdwe. Co., Knoxville, Tenn.	Good	10.00	.....	4.00	12.00	9.80	.....	4.00	11.84
88 Reynolds	116 Farmer's Home H. G. Phosph. & Potash	Swift Fert. Works, Atlanta, Ga.	Lowe Hdwe. Co., Knoxville, Tenn.	Good	10.00	.....	4.00	12.00	11.10	.....	2.93	11.81
87 Reynolds	114 Adair's Special Potash Mixture	Adair & McCarty Bros., Chattanooga, Tenn. . .	Baldwin Feed & Imp Co., Johnson City, Tenn. . .	Good	8.00	.....	4.00	10.40	7.28	.....	3.83	9.65
86 Reynolds	111 Coweta Standard H. G. Dis. Bone & Potash	Cowetta Fert. Co., Newnan, Ga.	Farmer's Exchange, Johnson City, Tenn. . .	Good	8.00	.....	4.00	10.40	9.68	.....	3.40	11.14
85 Reynolds	109 Coweta Wheat & Grass Grower	Cowetta Fert. Co., Newnan, Ga.	Farmer's Exchange, Johnson City, Tenn. . .	Good	10.00	.....	2.00	10.00	13.18	.....	1.75	12.29
84 Reynolds	107 Empire Special Bone & Potash	The Empire Guano Co., Nashville, Tenn.	Lineback Supply Co., Elizabethton, Tenn. . .	Good	12.00	.....	2.00	11.60	12.08	.....	1.56	11.22
83 Reynolds	104 Empire Potash Mixture	The Empire Guano Co., Nashville, Tenn.	Lineback Supply Co., Elizabethton, Tenn. . .	Good	10.00	.....	4.00	12.00	11.28	.....	2.85	11.87
82 Reynolds	97 Adair's Wheat & Corn Grower	Adair & McCarty Bros., Chattanooga, Tenn. . .	Bayless Hdwe. Co., Athens, Tenn.	Good	10.00	.....	4.00	12.00	11.38	.....	4.46	13.56

81	Reynolds	101	Tuscarora Bone & Potash	Tuscarora Fert. Co., Nashville, Tenn.	G. F. Lockmiller, Athens, Tenn.	Good	10.00	2.00	10.00	10.05	1.63	9.67
80	Reynolds	100	Tuscarora Bone & Potash	Tuscarora Fert. Co., Nashville, Tenn.	G. F. Lockmiller, Athens, Tenn.	Good	10.00	4.00	12.00	9.65	2.40	*10.12
79	Reynolds	92	Adair's Formula	Adair & McCarty Bros., Chattanooga, Tenn.	Bayless Hdw. Co., Athens, Tenn.	Good	10.00	2.00	10.00	9.50	2.23	9.33
78	Reynolds	79	Globe Potash Compound	Globe Fert. Co., Louisville, Ky.	W. M. Brown, LaFollette, Tenn.	Good	12.00	2.00	11.50	12.72	1.66	11.83
77	Reynolds	78	Eagle Brand Potash Compound	Louisville Fert. Co., Louisville, Ky.	J. M. Ward, Jonesboro, Tenn.	Good	8.00	4.00	10.40	8.33	4.28	10.94
76	Reynolds	76	Eagle Brand Potash Special	Louisville Fert. Co., Louisville, Ky.	J. M. Ward, Jonesboro, Tenn.	Good	10.00	4.00	12.00	10.15	3.98	12.10
75	Reynolds	73	Ox Brand H. G. Potash	Tennessee Chem. Co., Nashville, Tenn.	W. M. Lee & Co., Jonesboro, Tenn.	Good	10.00	6.00	14.00	9.60	4.15	*11.83
74	Reynolds	71	Ox Brand Potash Compound	Tennessee Chem. Co., Nashville, Tenn.	W. M. Lee & Co., Jonesboro, Tenn.	Good	8.00	4.00	10.40	9.57	4.04	11.69
73	Reynolds	65	Rome Bone & Potash	Rome Chem. Co., Atlanta, Ga.	J. B. King, Greenville, Tenn.	Good	10.00	2.00	10.00	13.60	1.64	12.52
72	Reynolds	61	Rome Bone & Potash	Rome Chem. Co., Atlanta, Ga.	J. B. King, Greenville, Tenn.	Good	8.00	4.00	10.40	10.20	2.97	11.15
71	Reynolds	60	Rome H. G. Bone & Potash	Rome Chem. Co., Atlanta, Ga.	J. B. King, Greenville, Tenn.	Good	10.00	4.00	12.00	11.49	3.90	13.09
70	Reynolds	53	Coweta Dissolved Bone & Potash	Cowetta Fert. Co., Newman, Ga.	E. A. Tarbett, Piney Flats, Tenn.	Good	10.00	4.00	12.00	11.90	3.08	12.69
69	Reynolds	59	Furman's Potash Special	Furman Farm Imp. Co., Atlanta, Ga.	H. L. Milligan, Greenville, Tenn.	Good	8.00	4.00	10.40	8.58	4.19	11.93
68	Reynolds	49	Acid Phosphate with Potash	Read Phosphate Co., Nashville, Tenn.	J. M. Ward, Jonesboro, Tenn.	Good	8.00	4.00	10.40	9.50	2.74	10.34
67	Reynolds	38	Furman's Bone & Potash	Furman Farm Imp. Co., Atlanta, Ga.	Crawford & Caldwell, Maryville, Tenn.	Wet	10.00	4.00	12.00	10.95	2.13	*10.89
66	Reynolds	33	Farmer's Home	Swett's Fert. Works, Atlanta, Ga.	H. & McNatt & Co., Maryville, Tenn.	Good	10.00	4.00	12.00	12.28	4.66	14.48

PHOSPHATE AND POTASH—OFFICIAL ANALYSES FOR 1913—Continued.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED				FOUND			
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value
65 Tomlinson ...	138 Anti-Trust Bone & Potash	International Agri. Cor., Nashville, Tenn.	Harp & Pointer, Algood, Tenn.	Good	10.00	.....	4.00	12.00	11.35	.....	2.27	11.35
64 Tomlinson ...	137 Bone & Potash	International Agri. Cor., Nashville, Tenn.	Harp & Pointer, Algood, Tenn.	Good	10.00	.....	2.00	10.00	11.15	.....	2.40	11.32
63 Tomlinson ...	127 Big Success Special	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. ...	Robertson & Johnson, Tullahoma, Tenn. ...	Good	14.00	.....	6.00	17.20	16.33	.....	3.01	*16.07
62 Tomlinson ...	116 H. G. Fertilizer	Taylor & Powell Fert. Co., Kinney, Tenn.	Taylor & Powell Fert. Co., Springfield, Tenn. ...	Good	10.00	.....	4.00	12.00	13.35	.....	3.04	13.72
61 Tomlinson ...	115 H. G. Fertilizer	Taylor & Powell Fert. Co., Kinney, Tenn.	Taylor & Powell Fert. Co., Springfield, Tenn. ...	Good	12.00	.....	2.00	11.60	14.78	.....	1.73	13.55
60 Tomlinson ...	124 Universal Cotton Special	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. ...	Robertson & Johnson, Tullahoma, Tenn. ...	Good	10.00	.....	4.00	12.00	11.90	.....	2.75	12.27
59 Tomlinson ...	102 Read's Alkaline Bone	Read Phosphate Co., Nashville, Tenn.	R. F. Overall & Co., Murfreesboro, Tenn. ...	Good	10.00	.....	2.00	10.00	11.00	.....	1.78	10.58
58 Tomlinson ...	92 Bone & Potash	Empire Guano Co., Nashville, Tenn.	J. T. Darnell, Morrison, Tenn.	Good	10.00	.....	2.00	10.00	10.73	.....	1.28	9.86
56 Tomlinson ...	61 Phospho-Potash	Fox Chem. Co., Louisville, Ky.	W. H. Stutts, St. Joseph, Tenn.	Good	9.00	.....	5.00	12.50	10.91	.....	4.40	13.12
57 Tomlinson ...	88 Phosphate & Potash	Armour's Fert. Works, Nashville, Tenn.	G. W. Darnell, Morrison, Tenn.	Good	10.00	.....	2.00	10.00	12.65	.....	1.05	11.17
55 Tomlinson ...	58 Farish Furman Formula	Furman Farm Imp. Co., Atlanta, Ga.	R. E. Green, St. Joseph, Tenn.	Good	10.00	.....	2.00	10.00	11.08	.....	1.71	10.57

54	Tomlinson	...	54	Sim's Formula	Leoma Union Whse. Mfg. Co., Leoma, Tenn.	G. W. Sticher, Leoma, Tenn.	Good	12.00	.....	2.00	11.60	16.41	.....	1.65	14.77
53	Tomlinson	...	49	Globe Bone Phosphate & Potash	Globe Fert. Co., Louisville, Ky.	Augustine Bros. & Co., Loretto, Tenn.	Good	10.00	.....	4.00	12.00	11.43	.....	3.29	12.43
52	Tomlinson	...	48	Globe Potash Special	Globe Fert. Co., Louisville, Ky.	Augustine Bros. & Co., Loretto, Tenn.	Good	10.00	.....	2.00	10.00	12.70	.....	1.50	11.66
51	Tomlinson	...	43	Chickamauga Bone & Potash	Chickamauga Fert. W., Chatanooga, Tenn.	Frank Meiers, Loretto, Tenn.	Good	10.00	.....	2.00	10.00	11.28	.....	2.05	11.07
50	Tomlinson	...	40	H. G. Phosphate & Potash	Armour's Fert. Works, Nashville, Tenn.	Frank Meiers, Loretto, Tenn.	Good	10.00	.....	4.00	12.00	10.63	.....	4.27	12.77
49	Tomlinson	...	34	Ashcraft Formula	Tenn. Valley Fert. Co., Florence, Ala.	Buchanan Bros., Lawrenceburg, Tenn.	Good	10.00	.....	2.00	10.00	11.78	.....	1.68	11.10
48	Tomlinson	...	24	Mule Brand Klon-dyke Acid Phos. & Potash	American Guano Co., Nashville, Tenn.	J. P. Adams, Manchester, Penn.	Good	10.00	.....	4.00	12.00	12.98	.....	3.57	13.98
47	Tomlinson	...	23	Mule Potash Mixture	American Guano Co., Nashville, Tenn.	J. P. Adams, Manchester, Tenn.	Good	10.00	.....	2.00	10.00	11.95	.....	1.84	11.40
46	Tomlinson	...	19	Ox Brand Potash Mixture	Tennessee Chem. Co., Nashville, Tenn.	Everett Hdwe. Co., Sparta, Tenn.	Good	10.00	.....	2.00	10.00	11.00	.....	1.97	10.77
45	Tomlinson	...	18	Ox Brand Alkaline Bone	Tennessee Chem. Co., Nashville, Tenn.	Everett Hdwe. Co., Sparta, Tenn.	Good	12.00	.....	2.00	11.60	12.13	.....	1.73	11.43
44	Tomlinson	...	16	Ox Brand Potash Formula	Tennessee Chem. Co., Nashville, Tenn.	G. Everett Hdwe. Co., Sparta, Tenn.	Good	10.00	.....	4.00	12.00	9.73	.....	3.34	*11.12
43	Tomlinson	...	9	Big Success Grain Grower	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Willis & McCrea, Manchester, Tenn.	Good	10.00	.....	2.00	10.00	12.13	.....	1.86	11.56
42	Tomlinson	...	14	Bear Brand Potash Mixture	Continental Fert. Co., Nashville, Tenn.	W. M. Young, Sparta, Tenn.	Good	10.00	.....	2.00	10.00	10.45	.....	1.85	10.24
41	Tomlinson	...	11	Black Patch Wheat Special	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Willis & McCrea, Manchester, Tenn.	Good	10.00	.....	4.00	12.00	11.65	.....	2.86	12.18
40	Tomlinson	...	8	Special	Huntsville Whse. Co., Huntsville, Ala.	W. D. Smith, Manchester, Tenn.	Good	10.00	.....	2.00	10.00	13.81	.....	2.03	13.07
38	Tomlinson	...	7	Special	Huntsville Whse. Co., Huntsville, Ala.	W. D. Smith, Manchester, Tenn.	Good	10.00	.....	4.00	12.00	13.20	.....	3.43	13.99

PHOSPHATE AND POTASH—OFFICIAL ANALYSES FOR 1913—Continued.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED			FOUND				
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value
36 Reynolds	102 Kennesaw Pure Animal Bone Meal	Va.-Carolina Chem. Co., Richmond, Va.	C. B. Richmond, Church Hill, Tenn.	Good	20.00	3.70	.....	30.80	21.00	3.78	.....	31.32
102 DeBerry	41 Triangle Fish Potash Mixture	International Agri. Co., Nashville, Tenn.	J. C. Peterson, Lexington, Tenn.	Good	10.00	.....	2.00	10.00	12.00	.....	1.80	11.40
101 DeBerry	35 Forked Deer Phos. Acid & Potash	Tenn. Cotton Oil Co., Jackson, Tenn.	J. W. Smith, Parsons, Tenn.	Good	10.00	.....	4.00	12.00	10.64	.....	3.49	12.00
231 DeBerry	66 Tiger Guano	International Agri. Co., Nashville, Tenn.	Watson & Watson, Huntingdon, Tenn.	Good	10.00	.....	2.00	10.00	8.80	.....	1.14	*8.18
343 Reynolds	130 Victor Special Bone & Potash	Victor Guano Co., Nashville, Tenn.	M. S. Roberts & Son, Greeneville, Tenn.	Good	8.00	.....	4.00	10.40	10.35	.....	2.61	10.89
351 Reynolds	156 Sadler's Formula	International Fert. Co., Nashville, Tenn.	W. G. Robinson, Newport, Tenn.	Good	12.00	.....	2.00	11.60	12.95	.....	3.18	13.54
350 Reynolds	154 Special Mixture	International Agri. Co., Florence, Ala.	Stokeley Bros. Co., Newport, Tenn.	Good	10.00	.....	8.00	16.00	10.98	.....	7.56	16.34
349 Reynolds	150 Crop Grower	Marietta Fert. Co., Marietta, Ga.	N. L. McSween Hdwe. Co., Newport, Tenn.	Damp	10.00	.....	4.00	12.00	10.78	.....	4.27	12.83
348 Reynolds	144 Swift's Field & Farm Phosph. & Potash	Swift Fert. Works, Atlanta, Ga.	Farmers' Union Co., Jonesboro, Tenn.	Good	10.00	.....	2.00	10.00	11.03	.....	1.95	10.77
247 Reynolds	142 Hiawassee 10-2	Hiawassee Guano Co., Atlanta, Ga.	Farmers' Union Co., Jonesboro, Tenn.	Good	10.00	.....	2.00	10.00	10.68	.....	1.95	10.49
346 Reynolds	141 Hiawassee 10-4	Hiawassee Guano Co., Atlanta, Ga.	Farmers' Union Co., Jonesboro, Tenn.	Good	10.00	.....	4.00	12.00	10.60	.....	3.90	12.38

343	Reynolds	....	140	Hiawassee 8-4	.....	Hiawassee Guano Co., Atlanta, Ga.	Farmers' Union Co., Jonesboro, Tenn.	Good	8.00	.....	4.00	10.40	6.95	.....	4.52	10.08
344	Reynolds	....	137	Tuscarora 8-4	.....	Tuscarora Fert. Co., Nashville, Tenn.	M. S. Roberts & Son, Greeneville, Tenn. ...	Good	8.00	.....	4.00	10.40	10.55	.....	3.72	12.16
206	Tomlinson	...	146	Red Line Phos. with Potash	.....	American Agri. Chem. Co., Cincinnati, O. ...	E. T. Smith, Clarksville, Tenn. ...	Good	10.00	.....	2.00	10.00	11.48	.....	1.82	11.00
201	Tomlinson	...	140	H. G. Potash Mix- ture	.....	Read Phosphate Co., Nashville, Tenn.	J. Whitson Hdw. Co., Cookeville, Tenn.	Good	10.00	.....	4.00	12.00	10.50	.....	3.20	11.80
342	Reynolds	....	129	Victor H. G. Potash & Acid	.....	Victor Guano Co., Nashville, Tenn.	N. S. Roberts & Son, Greeneville, Tenn.	Good	10.00	.....	4.00	12.00	10.90	.....	3.99	12.71
99	DeBerry	.....	30	Black Patch Cotton Grower	.....	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. ...	J. W. Smith, Parsons, Tenn.	Good	10.00	.....	2.00	10.00	11.90	.....	1.47	10.93

* Falls more than 3 per cent. below guaranteed analysis in comparative value.

ACID PHOSPHATE—OFFICIAL ANALYSES FOR 1913.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED						FOUND			
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Commercial Value	Commercial Value
96 DeBerry	112 Forked Deer H. G. Acid Phosphate	Tenn. Cotton Oil Co., Jackson, Tenn.	W. T. Pofford, Big Sandy, Tenn.	Good	14.00	.....	.....	11.20	16.68	.....	.....	.....	.....	13.34
95 DeBerry	98 H. G. Cotton Belt Acid Phosphate	Tupelo Fere Co., Tupelo, Miss.	J. H. Davidson, Henderson, Tenn.	Good	16.30	.....	.....	12.80	19.52	.....	.....	.....	.....	15.62
94 DeBerry	93 Great So. Special Acid Phosphate	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	Jones & Hendrix, Henderson, Tenn.	Good	16.00	.....	.....	12.80	18.58	.....	.....	.....	.....	14.86
93 DeBerry	85 Scott's H. G. Acid Phosphate	Va.-Carolina Chem. Co., Memphis, Tenn.	W. T. Ingram, Bolivar, Tenn.	Good	16.00	.....	.....	12.80	16.40	.....	.....	.....	.....	13.12
92 DeBerry	79 So. Cotton Oil Co. Acid Phosphate	So. Cotton Oil Co., Memphis, Tenn.	Hunt & Rose, Grand Junction, Tenn.	Good	16.00	.....	.....	12.80	18.60	.....	.....	.....	.....	14.88
35 DeBerry	28 Forked Deer Acid Phosphate	Tenn. Cotton Oil Co., Jackson, Tenn.	J. H. Todd, Henderson, Tenn.	Good	16.00	.....	.....	12.80	17.87	.....	.....	.....	.....	14.30
34 Reynolds	106 Empire Special H. G. Acid Phosphate	The Empire Guano Co., Nashville, Tenn.	Linckhack Supply Co., Elizabethton, Tenn.	Good	15.00	.....	.....	12.00	16.18	.....	.....	.....	.....	12.94
33 Reynolds	98 Tuscarora Acid Phosphate	Tuscarora Fert. Co., Nashville, Tenn.	G. F. Lockmiller, Athens, Tenn.	Good	16.00	.....	.....	12.80	15.57	.....	.....	.....	.....	12.57
32 Reynolds	94 Adair's H. G. Dissolved Bone	A. D. Adair & McCarty Bros., Chattanooga	Payless Hdwe. Co., Athens, Tenn.	Good	16.00	.....	.....	12.80	16.93	.....	.....	.....	.....	13.54
31 Reynolds	91 Adair's H. G. Dissolved Bone	A. D. Adair & McCarty Bros., Chattanooga	Payless Hdwe. Co., Athens, Tenn.	Good	14.00	.....	.....	11.20	14.40	.....	.....	.....	.....	11.52
30 Reynolds	77 Eagle Brand H. G. Dissolved Bone	Louisville Fert. Co., Louisville, Ky.	J. M. Ward, Jonesboro, Tenn.	Good	14.00	.....	.....	11.20	14.07	.....	.....	.....	.....	11.26

29	Reynolds	66	Rome H. G. Dissolved Bone	Rome Chemical Co., Rome, Ga.	J. B. King, Greenville, Tenn.	Good	14.00	11.20	16.55	12.24
28	Reynolds	45	H. G. Acid Phosphate	Read Phosphate Co., Nashville, Tenn.	Rogan Son & Niece, Rogersville, Tenn.	Good	14.00	11.20	13.86	11.09
27	Reynolds	40	Furman's H. G. Bone	Furman Farm Imp. Co., Atlanta, Ga.	Crawford Caldwell, Maryville, Tenn.	Good	16.00	12.80	15.87	12.70
26	Reynolds	31	Supreme	Morris Fert. Co., Atlanta, Ga.	Hall Bros. Co., Cleveland, Tenn.	Good	16.00	12.80	15.05	12.04
25	Tomlinson	147	H. G. Acid Phosphate	International Agri. Cor., Nashville, Tenn.	E. T. Smith, Clarksville, Tenn.	Good	16.00	12.80	15.78	12.62
22	Tomlinson	121	Read's H. G. Special Acid Phosphate	Read Phosphate Co., Nashville, Tenn.	Henegar & Martin, McMinnville Tenn.	Good	16.00	12.80	16.45	13.16
21	Tomlinson	120	Read's Matchless Acid Phosphate	Read Phosphate Co., Nashville, Tenn.	Henegar & Martin, McMinnville Tenn.	Good	12.00	9.60	12.98	10.38
20	Tomlinson	118	Tiger H. G. Dissolved Bone	International Agri. Cor., Florence, Ala.	H. D. Wood, McMinnville, Tenn.	Good	14.00	11.20	14.95	11.96
19	Tomlinson	95	H. G. Dissolved Bone	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	R. H. Berry & Son, Morrison, Tenn.	Good	16.00	12.80	17.80	14.24
18	Tomlinson	94	Mt. Pleasant Special Acid Phosphate	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn.	R. H. Berry & Son, Morrison, Tenn.	Good	14.00	11.20	15.96	12.76
17	Tomlinson	93	H. G. Acid Phosphate	The Empire Guano Co., Nashville, Tenn.	J. T. Darnell, Morrison, Tenn.	Good	14.00	11.20	14.79	11.83
16	Tomlinson	90	Armour's Acid Phosphate Fert., H. G.	Armour's Fert. Works, Nashville, Tenn.	G. W. Darnell, Morrison, Tenn.	Good	16.00	12.80	17.03	13.62
15	Tomlinson	89	Armour's Star Phosphate Fertilizer	Armour's Fert. Works, Nashville, Tenn.	G. W. Darnell, Morrison, Tenn.	Good	14.00	11.20	14.08	11.26
14	Tomlinson	87	Hiawassee 16	Hiawassee Guano Co., Atlanta, Ga.	G. W. Darnell, Morrison, Tenn.	Good	16.00	12.80	15.15	12.12
13	Tomlinson	57	Furman's Dissolved Bone	Furman Farm Imp. Co., Atlanta, Ga.	R. E. Green, St. Joseph, Tenn.	Good	12.00	9.60	12.44	9.95
12	Tomlinson	55	Wood's H. G. Dissolved Bone	Leoma Union Whse Mfg Co., Leoma, Tenn.	G. W. Stisher, Leoma, Tenn.	Fair	16.00	12.80	17.27	13.31

ACID PHOSPHATE—OFFICIAL ANALYSES FOR 1913—Continued.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED			FOUND			
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value
11 Tomlinson ...	46 Globe H. G. Acid Phosphate	Globe Fert. Co., Louisville, Ky.	Augustine Bros. & Co., Loretto, Tenn.	Good	16.00	.....	12.80	15.78	.....	.....	12.62
10 Tomlinson ...	45 Chickamauga Dis- solved Bone	Chickamauga Fert. Co., Chattanooga, Tenn. ..	Frank Mims, Loretto, Tenn.	Good	12.00	.....	9.60	13.54	.....	.....	10.83
9 Tomlinson ...	42 Chickamauga H. G. Dissolved Bone ..	Chickamauga Fert. Co., Chattanooga, Tenn. ..	Frank Mims, Loretto, Tenn.	Good	16.00	.....	12.80	16.37	.....	.....	13.09
8 Tomlinson ...	36 Tiger Acid Phos- phate	Tenn. Valley Fert. Co., Florence, Ala.	Buchanan Bros., Lawrenceburg, Tenn. .	Good	16.00	.....	12.80	15.93	.....	.....	12.74
7 Tomlinson ...	22 H. G. Dissolved Bone	Tennessee Chem. Co., Nashville, Tenn.	Smart Bros. & Willis, Manchester, Tenn. ...	Good	14.00	.....	11.20	13.99	.....	.....	11.19
6 Tomlinson ...	17 Tenn. Best Acid Phosphate	Tennessee Chem. Co., Nashville, Tenn.	Everett Hdw. Co., Sparta, Tenn.	Good	16.00	.....	12.80	14.78	.....	.....	*11.82
5 Tomlinson ...	12 Big Success, Mt. Pleasant Special Acid Phosphate ..	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. ..	Willis & McCrea, Manchester, Tenn. ...	Good	14.00	.....	11.20	15.69	.....	.....	12.55
4 Tomlinson ...	10 Big Success H. G. Dissolved Bone ..	Mt. Pleasant Fert. Co., Mt. Pleasant, Tenn. ..	Willis & McCrea, Manchester, Tenn. ...	Good	16.00	.....	12.80	16.49	.....	.....	13.19
3 Tomlinson ...	5 Reliance Acid Phos- phate	Huntsville Whse. Co., Huntsville, Ala.	W. D. Smith, Manchester, Tenn. ...	Damp	14.00	.....	11.20	14.23	.....	.....	11.38
2 Tomlinson ...	4 Climax Acid Phos- phate	Huntsville Whse. Co., Huntsville, Ala.	W. D. Smith, Manchester, Tenn. ...	Damp	16.00	.....	12.80	16.06	.....	.....	12.84
1 Tomlinson ...	3 Liberty H. G. Dis- solved Bone	Florence Cotton Oil Co., Florence, Ala.	W. D. Smith, Manchester, Tenn. ...	Good	14.00	.....	11.20	15.32	.....	.....	12.25

332	Reynolds	....	133	Rome Standard Acid Phosphate	Rome Chem. Co., Atlanta, Ga.	J. B. King, Greeneville, Tenn.	Good	12.00	.....	9.60	12.33	.....	9.86
341	Reynolds	....	146	Acid Phosphate	Fox Chem. Co., Louisville, Ky.	B. G. Clark, White Pine, Tenn.	Good	14.00	.....	11.20	16.05	.....	12.84
340	Reynolds	....	145	H. G. Acid Phosphate	Fox Chem. Co., Louisville, Ky.	B. G. Clark, White Pine, Tenn.	Good	16.00	.....	12.80	16.55	.....	13.24
339	Reynolds	....	125	Standard Grade Dissolved Bone	Cowetta Fert. Co., Newnan, Ga.	Bird Bros., Greeneville, Tenn.	Good	12.00	.....	9.60	12.20	.....	9.76
338	Reynolds	....	124	H. G. Cowetta	Cowetta Fert. Co., Newnan, Ga.	Bird Bros., Greeneville, Tenn.	Damp	16.00	.....	12.80	16.15	.....	12.92
337	Reynolds	....	151	H. G. Dissolved Bone	Marietta Fert. Co., Marietta, Ga.	N. L. McSween Hdwe. Co., Newport, Tenn.	Good	14.00	.....	11.20	12.85	.....	*10.28
336	Reynolds	....	153	Eagle Excelsior Acid Phosphate	Louisville Fert. Co., Louisville, Ky.	Stokeley Bros., Newport, Tenn.	Good	16.00	.....	12.80	17.00	.....	13.60
335	Reynolds	....	157	Bear	Continental Fert. Co., Nashville, Tenn.	D. R. Mayo, Knoxville, Tenn.	Good	16.00	.....	12.80	17.85	.....	14.28
334	Reynolds	....	136	Victor Standard Gr. Acid Phosphate	Victor Guano Co., Atlanta, Ga.	M. S. Roberts & Sons, Greeneville, Tenn.	Good	12.00	.....	9.60	12.25	.....	9.80
323	Reynolds	....	139	Hiawassee 14 per cent Acid Phos.	Hiawassee Guano Co., Atlanta, Ga.	Farmers' Union Co., Jonesboro, Tenn.	Good	.....	14.00	.....	11.20	.....	11.60

* Falls more than 3 per cent. below guaranteed analysis in comparative value.

FERTILIZER MATERIALS—OFFICIAL ANALYSES FOR 1913.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED				FOUND				
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	
98 DeBerry	91 German Kainit	Tenn. Cotton Oil Co., Jackson, Tenn.	F. H. Todd, Henderson, Tenn.	Good	.....	.....	12.00	12.00	.....	.....	.....	12.14	12.14
97 DeBerry	117 German Kainit	German Kali Works, New Orleans, La.	R. J. Miller, Brighton, Tenn.	Good	.....	.....	12.00	12.00	.....	.....	.....	13.71	13.71
104 Reynolds	42 Pure Raw Bone	Read Phosphate Co., Nashville, Tenn.	Rogan Son & Nice, Rogersville, Tenn.	Good	23.00	3.70	.....	33.20	19.10	3.78	.....	*30.40	*30.40
103 Reynolds	36 Muriate of Potash	Swift Fert. Works, Atlanta, Ga.	R. G. McNutt Hdwe. Co., Maryville, Tenn.	Good	.....	.....	50.00	50.00	.....	.....	49.68	49.68	49.68
128 Tomlinson	142 Muriate of Potash	Read Phosphate Co., Nashville, Tenn.	Jerre Whitson Hdwe. Co., Cookeville, Tenn.	Good	.....	.....	50.00	50.00	.....	.....	51.97	51.97	51.97
330 DeBerry	94 Muriate of Potash	Mt. Pleasant Fert. Co., Jackson, Tenn.	Jones & Hendrix, Henderson, Tenn.	.....	.....	.....	.....	.....	.....	.....	49.68	49.68	49.68
329 DeBerry	90 Muriate of Potash	Tenn. Cotton Oil Co., Jackson, Tenn.	F. H. Todd, Henderson, Tenn.	Good	.....	.....	50.00	50.00	.....	.....	50.42	50.42	50.42
106 DeBerry	88 Nitrate of Soda	Tenn. Coeton Oil Co., Jackson, Tenn.	F. H. Todd, Henderson, Tenn.	Good	.....	16.00	.....	64.00	.....	15.84	.....	63.36	63.36
107 DeBerry	89 Cotton Seed Meal	Tenn. Cotton Oil Co., Jackson, Tenn.	F. H. Todd, Henderson, Tenn.	Good	.....	6.18	.....	24.72	.....	7.24	.....	28.96	28.96
108 DeBerry	95 Nitrate of Soda	Mt. Pleasant, Fert. Co., Mt. Pleasant, Tenn.	Jones & Hendrix, Henderson, Tenn.	Good	.....	.....	.....	.....	.....	15.59	.....	62.36	62.36
109 DeBerry	101 Nitrate of Soda	Read Phosphate Co., Nashville, Tenn.	Nelson & Stallings, Humboldt, Tenn.	Good	.....	15.25	.....	61.00	.....	15.17	.....	60.63	60.63

110	DeBerry	.....	114	Nitrate of Soda	..	So. Cotton Oil Co., Memphis, Tenn.	Duffey & Stallings, Humboldt Tenn. ....	.....	14.85	.....	59.40	.....	15.51	.....	62.04	
111	DeBerry	.....	145	Nitrate of Soda	....	Federal Chem. Co., Nashville, Tenn.	H. F. Hamilton, Humboldt, Tenn. ....	.....	15.60	.....	62.40	.....	15.13	.....	61.24	
122	DeBerry	.....	4	Nitrate of Soda	....	Tennessee Chem. Co., Nashville, Tenn.	L. C. James, Gibson, Tenn. ....	.....	14.81	.....	59.24	.....	15.56	.....	62.24	
123	DeBerry	.....	..	Nitrate of Soda	....	Globe Fert. Co., Nashville, Tenn.	M. F. Hamilton, Humboldt, Tenn. ....	.....	.....	.....	.....	.....	15.84	.....	63.36	
127	Tomlinson	...	136	Nitrate of Soda	....	Read Phosphate Co., Nashville, Tenn.	A. J. Mosfield, Livingston, Tenn. ....	.....	15.57	.....	62.28	.....	14.92	.....	*59.68	
126	DeBerry	.....	69	Muriate of Potash	..	International Agri. Cor., Nashville, Tenn.	Watson & Watson, Huntingdon, Tenn. ..	.....	48.00	.....	48.00	.....	47.65	.....	47.65	
125	DeBerry	.....	70	Nitrate of Soda	....	International Agri. Cor., Nashville, Tenn.	Watson & Watson, Huntingdon, Tenn. ..	.....	14.50	.....	58.00	.....	14.73	.....	58.92	
124	DeBerry	.....	14	Nitrate of Soda	....	National Fert. Co., Nashville, Tenn.	J. T. Warmath, Gibson Tenn. ....	.....	14.57	.....	58.28	.....	14.09	.....	*56.36	
105	Reynolds	....	119	Pure Raw Bone Meal	..	Chickamauga Fert. W., Chattanooga, Tenn.	Wright Hdwe. Co., Knoxville, Tenn. ....	.....	20.00	1.70	.....	22.80	21.00	4.34	.....	34.16
112	Tomlinson	...	29	Armour's Raw Bone Meal Fertilizer	..	Armour's Fert. Works, Omaha, Neb.	M. Richardson, Lawrenceburg, Tenn. ....	.....	22.00	3.71	.....	32.44	27.20	3.69	.....	36.02
114	Tomlinson	...	63	A. Corn Raw Bone	..	Globe Fert. Co., Louisville, Ky.	Smith Bros., Dorris Co., Springfield, Tenn. ....	.....	24.00	2.88	.....	30.72	23.50	2.92	.....	30.48
113	Tomlinson	...	62	Globe Raw Bone	...	Globe Fert. Co., Louisville, Ky.	Smith Bros., Dorris Co., Springfield, Tenn. ....	.....	22.30	3.69	.....	32.36	20.95	3.95	.....	32.56
115	Tomlinson	...	64	Golden Harvest Bone Meal Mixture	....	Globe Fert. Co., Louisville, Ky.	Smith Bros., Dorris Co., Springfield, Tenn. ....	.....	21.00	1.65	.....	23.40	22.65	1.67	.....	24.80
116	Tomlinson	...	71	Homestead Raw Bone	.....	American Agri. Chem. Co., Cincinnati, O.	L. F. Bell & Co., Springfield, Tenn. ....	.....	22.00	3.29	.....	30.76	23.40	3.89	.....	34.28
117	Tomlinson	...	72	Half & Half	.....	Taylor & Powell Fert. Co., Kinney, Tenn.	Taylor & Powell Fert. Co., Springfield, Tenn. ....	.....	10.00	1.85	.....	13.40	12.25	2.15	.....	18.40
118	Tomlinson	...	73	Pure Raw Bone Meal	...	Taylor & Powell Fert. Co., Kinney, Tenn.	Taylor & Powell Fert. Co., Springfield, Tenn. ....	.....	22.00	3.71	.....	32.44	21.80	4.13	.....	33.96

FERTILIZER MATERIALS—OFFICIAL ANALYSES FOR 1913—Continued.

INSPECTOR	BRAND	MANUFACTURER	DEALER	Mechanical Condition	GUARANTEED				FOUND			
					Available Phosphoric Acid	Nitrogen	Potash	Commercial Value	Available Phosphoric Acid	Nitrogen	Potash	Commercial Value
121 Tomlinson ...	111 Harvest Home Bone Meal Mixture ...	Federal Chem. Co., Louisville, Ky.	Matthews & Murphy, Springfield, Tenn. ...	Good	20.00	1.65	.....	22.60	23.30	1.80	.....	25.84
120 Tomlinson ...	109 Daybreak Raw Bone	Federal Chem. Co., Louisville, Ky.			Matthews & Murphy, Springfield, Tenn. ...	25.00	3.69	34.76	23.10	3.88	.....	34.00
1119 Tomlinson ...	76 Half & Half Bone Meal Mixture ...	Fox Chem. Co., Louisville, Ky.	J. A. Long & Co., Springfield, Tenn. ...	Good	20.00	1.65	.....	22.60	21.25	1.85	.....	24.40
267 Reynolds	162 Pure Raw Bone Meal	Furman Farm Imp. Co., Atlanta, Ga.	Bryant Hdwe. Co., Cleveland, Tenn.	Good	20.00	3.70	.....	30.80	20.70	4.13	.....	33.08

* Falls more than 3 per cent. below guaranteed analysis in comparative value.



J. W. SAMPLE
STATE CHEMIST

TENNESSEE FERTILIZER LAW.

Chapter 417, House Bill No. 390.

A BILL to be entitled "An Act to regulate the registration, sale, inspection and analysis of commercial fertilizers, acid phosphates, fertilizer material and chemicals in the State of Tennessee, and to consolidate all laws relating to said sales, inspection and analysis, and to repeal all other laws or parts of laws in conflict therewith."

SECTION 1. *Be it enacted by the General Assembly of the State of Tennessee*, That all manufacturers, jobbers and manipulators of commercial fertilizers, and fertilizer material to be used in the manufacture of the same, who may desire to sell or offer for sale in the State of Tennessee such commercial fertilizers and fertilizer materials, shall first file with the Commissioner of Agriculture of the State of Tennessee, upon forms furnished by said Commissioner, the name of each brand of commercial fertilizer, acid phosphate, fertilizer material or chemical which they may desire to sell in said State, either by themselves or their agents, together with the name and address of the manufacturer or manipulator, and also the guaranteed analysis thereof, stating the sources from which the phosphoric acid, nitrogen and potash are derived; and if the same commercial fertilizer is sold under a different name or names, said facts shall be stated, and the different brands which are identical shall be named.

SEC. 2. All persons, companies, manufacturers, dealers, or agents, before selling or offering for sale in this State any commercial fertilizer or fertilizer material, shall brand or attach to each bag, barrel, or package the name and address of the manufacturer, and the guaranteed analysis of the commercial fertilizer, giving the valuable constituents of the commercial fertilizer in minimum percentages only. Only these items shall be branded, or printed, on the package in the following order:

1. Weight of each package in pounds.
2. Brand name or trade mark.
3. Guaranteed analysis.
4. Available phosphoric acid—per cent.
5. Nitrogen—per cent.
6. Potash—per cent. . .
7. Name and address of the manufacturer.

In the bone meal, tankage, or other products where the phosphoric acid is not available to laboratory methods, but becomes available on the decomposition of the product in the soil, the phosphoric acid shall be claimed as total phosphoric acid, unless it be desired to claim available phosphoric acid also, in which latter case the guarantee must take the form above set forth. In the case of bone meal and tankage, manufacturers may brand on these bags information showing the fineness

of the product, provided it takes a form approved by the Commissioner of Agriculture.

SEC. 3. If any commercial fertilizer or fertilizer material offered for sale in the State shall, upon official analysis, prove deficient in any of its ingredients as guaranteed and branded upon the sacks or packages, and if by reason of such deficiency the commercial value thereof shall fall 3 per cent below the guaranteed total commercial value of such commercial fertilizer or fertilizer material, then any note or obligation given in payment thereof shall be collectible by law only for the amount of the actual total commercial value as ascertained by said official analysis. Whenever the Commissioner of Agriculture shall be satisfied that any commercial fertilizer is essentially below the guaranteed value in plant food, it shall be his duty to assess said deficiency against the manufacturer of the commercial fertilizer and require that the value of the deficiency be made good to all persons who, in the opinion of the Commissioner, have purchased the said low grade commercial fertilizer; and the Commissioner may seize any commercial fertilizer belonging to the said company, if the deficiency shall not be paid within thirty days after notice to the company. If the Commissioner shall be satisfied that the deficiency in plant food was due to the intention or fraud of the manufacturer, then the Commissioner shall assess and collect from the manufacturer twice the amount of the deficiency and pay over the same to the parties who purchased said commercial fertilizer; that if any manufacturer shall resist such collection or payment, the Commissioner shall immediately publish the analysis and the facts in the Bulletin and in such newspapers in the State as he may deem necessary.

SEC. 4. *Be it further enacted*, That the words "high grade" shall not appear upon any bag or other package of any complete commercial fertilizer, which complete fertilizer contains, by its guaranteed analysis, less than 10 per cent of available phosphoric acid, 1.65 per cent of nitrogen (equivalent to 2 per cent ammonia), and 2 per cent of potash, or a grade or analysis of equal total commercial value; that the word "standard" shall not appear upon any bag or other package of any complete commercial fertilizer which contains, by its guaranteed analysis, less than 8 per cent of available phosphoric acid, 1.65 per cent of nitrogen (equivalent to 2 per cent ammonia), and 2 per cent of potash, or a grade or analysis of equal total commercial value; that the words "high grade" shall not appear upon any bag or other package of any acid phosphate with potash which shall contain, by its guaranteed analysis, less than 13 per cent of available phosphoric acid and 1 per cent of potash, or a grade or analysis of equal total commercial value; that the word "standard" shall not appear upon any bag or other package of any acid phosphate with potash which shall contain, by its guaranteed analysis, less than 11 per cent of available phosphoric acid and

1 per cent of potash, or a grade or analysis of equal total commercial value; that the words "high grade" shall not appear upon any bag or other package of any plain acid phosphate which shall contain, by its guaranteed analysis, less than 14 per cent of available phosphoric acid; and, lastly, that the word "standard" shall not appear upon any bag or other package of any plain acid phosphate which shall contain, by its guaranteed analysis, less than 12 per cent of available phosphoric acid.

It is further hereby provided that no complete fertilizer, acid phosphate with potash, acid phosphate with nitrogen, or plain acid phosphate, shall be offered for sale in this State which contains less than 12 per cent of total plant food, namely, available phosphoric acid; nitrogen, and potash, either singly or in combination; provided, that in mixed commercial fertilizers there shall not be claimed less than 1 per cent of potash and 0.32 per cent of nitrogen when one or both are present in the same mixture.

SEC. 5. *Be it further enacted*, That all manufacturers and manipulators, or agents representing them, who have registered their brands in compliance with Section 1 of this Act shall forward to the Commissioner of Agriculture a request for tax tags, stating that said tags are to be used upon brands of commercial fertilizers and fertilizer materials registered in accordance with this Act, and said request shall be accompanied with the sum of 50 cents per ton as an inspection fee; whereupon it shall be the duty of the Commissioner of Agriculture to issue tags to parties applying, who shall attach a tag to each bag, barrel, or package thereof, which, when attached to said package, shall be *prima facie* evidence that the seller has complied with the requirements of this Act. Any tags left in the possession of the manufacturers shall not be used for another season, but shall be redeemed with new tags within sixty days after the close of the department's fiscal year, which fiscal year shall be comprised between the dates of June 1, inclusive. The color of said tax tags must be changed each fiscal year, and there shall not be printed upon said tax tags any brand name or analysis.

SEC. 6. *Be it further enacted*, That it shall not be lawful for any manufacturer or company, either by themselves or their agents, to sell or offer for sale in this State any commercial fertilizer or fertilizer material that has not been registered with the Commissioner of Agriculture as required by this Act. The fact that the purchaser waives the inspection and analysis thereof shall be no protection to said party selling or offering the same for sale.

SEC. 7. The guaranteed analysis of each and every brand of commercial fertilizer or fertilizer material must, without exception, remain uniform throughout the fiscal year for which it is registered; and in no case, even at subsequent registration, shall the grade be lowered, although the proportion of available constituents may be changed so

that the increase of one constituent may be compensated for in value by the increase of the other or others. Such proposed change must first receive the approval of the Commissioner of Agriculture.

A brand name (and) or trade-mark registered by one manufacturer shall not be entitled to registry by another, and the manufacturer having first registered and used the same brand name (and) or trade-mark shall be entitled to it, even should said brand name (and) or trade-mark not be offered for current registration at the time—nothing in this section to be construed as debarring the right of any manufacturer to establish his ownership in, and prior right of registration of, any brand name (and) or trade-mark, whether said brand name (and) or trademark had been previously registered or not.

SEC. 8. No person, company, dealer, or agent shall sell, expose, or offer for sale in this State, any pulverized leather—raw, steamed, roasted or in any other form—either as a commercial fertilizer or fertilizer material, without first making full, explicit statement of the facts in registration with the Commissioner of Agriculture and furnishing satisfactory proof that the nitrogen is sufficiently available and valuable for the purpose for which it is sold.

SEC. 9. *Be it further enacted*, That the Commissioner of Agriculture shall appoint not to exceed three inspectors of commercial fertilizers, who shall hold their offices for such time as said Commissioner, in his judgment, shall think best for carrying on the provisions of this Act. The greatest compensation which any one inspector of commercial fertilizers shall receive shall be at the rate of \$83.33 per month and his actual expenses while in the discharge of his duty as such inspector. It shall be his duty to inspect all commercial fertilizers, acid phosphates, chemicals, cottonseed meal, or other fertilizing material that may be found at any point within the limits of the State, and to go to any point when so directed by the Commissioner of Agriculture; and he shall see that all commercial fertilizers and fertilizer materials are properly tagged.

SEC. 10. *Be it further enacted*, That each of the inspectors of commercial fertilizers shall be provided with bottles of not less than eight (8) ounces capacity in which to place samples of commercial fertilizers and fertilizer materials drawn by him; and it shall be the duty of each inspector of commercial fertilizers to draw with such an instrument as shall secure a core from the entire length of the sack of commercial fertilizers and fertilizer materials, as he may be directed by the Commissioner of Agriculture to inspect or that he may find uninspected, and in the performance of his duty he shall carefully draw samples as follows:

In lots of ten packages or less, from every package; in lots of from ten to one hundred packages, from not less than ten packages; in lots of one hundred packages and over, from not less than 10 per cent of

the entire number. And after thoroughly mixing the samples so drawn, he shall, by the method known as "quartering," draw from such thoroughly mixed samples two sub-samples, and with them fill two sample bottles, and shall plainly write on a label on said bottles the number of said samples, and shall also write on the label on one only of said bottles the name of the commercial fertilizer, acid phosphate, or other fertilizer material, also the name of the manufacturer. He shall then seal both of said bottles, and shall forward to the Commissioner of Agriculture the said samples so drawn by him, stating the number of sacks from which the samples were drawn, and a full report of the inspection written on a form prescribed by the Commissioner of Agriculture, which report must be numbered to agree with the number on the bottles; and in said report shall be given the name of the commercial fertilizer or fertilizer material, the name of the manufacturer, the guaranteed analysis, the place where inspected, the date of the inspection, and the name of the inspector; and it shall be the duty of said inspectors to keep a complete record of all inspections made by them on forms prescribed by the Commissioner. Before entering upon the discharge of their duties they shall also take and subscribe before some officer authorized to administer the same an oath to faithfully discharge all the duties which may be required of them in pursuance of this Act.

Any person not a dealer in, or agent for the sale of, any commercial fertilizer who may purchase any commercial fertilizer in this State for his own use, and not for sale, may take a sample of the same for analysis, which analysis shall be made by the Department of Agriculture free of charge. Such samples for free analysis shall be taken by the purchaser in the presence of the person, company, or agent selling the commercial fertilizer, from at least 10 per cent of the sacks or other packages comprising the whole lot purchased, and shall be thoroughly mixed; and at least one pound of the material, after mixing, must be put into a jar or can, securely sealed, and marked in such a way as to surely identify the sample and show by whom it was sent, without giving the name of the commercial fertilizer or the person from whom it was purchased, and must be forwarded to the Commissioner of Agriculture. The purchaser shall also send with the sample a certificate signed by himself and witness, or by two witnesses, stating that the sender has purchased the commercial fertilizer for his own use, and not for sale, and that the sample was taken in the manner prescribed in this section; provided, however, that if the person, company, or agent, shall refuse to witness the taking of the sample, then the sample may be taken at the time of the purchase in the manner already prescribed, in the presence of two witnesses, who shall certify to the manner of taking the sample. The purchaser shall preserve the official label from one of the bags or other packages sampled, to be

sent to the Commissioner after having received the report of the analysis of the sample, and at the same time he shall furnish to the Commissioner the name and address of the firm of whom the commercial fertilizer was purchased and the amount purchased; and any person having sent a sample for free analysis, under the provision of this section, who shall, after having received the report of the analysis of same, refuse to furnish the required information, shall thereafter forfeit the privilege of free analysis of commercial fertilizers under this section; but if any sample shall have been submitted for free analysis, without all the requirements of this section having been complied with, the Commissioner shall inquire into the case, and may accept sample for free analysis, if he believes that it is a fair sample of the commercial fertilizer as it was delivered to the purchaser.

SEC. 11. *Be it further enacted*, That a sample of all commercial fertilizers or fertilizer materials, drawn by the official inspectors and filed with the Commissioner of Agriculture, shall be marked by number and delivered by said Commissioner to the director of the Experiment Station, who shall make a complete analysis of the same and certify under the same number as marked, said analysis to said Commissioner, which analysis shall be recorded as official and entered opposite the brand of commercial fertilizer or fertilizer material which the mark and number represent; and only the said official analysis of such commercial fertilizer or fertilizer material which the mark and number represent, and only the said official analysis of such fertilizer or fertilizer material, under the seal of the Commissioner of Agriculture, shall be admissible as evidence in any of the courts of this State on the trial of any issue involving the merits of such commercial fertilizer or fertilizer material.

SEC. 12. *Be it further enacted*, That the Commissioner of Agriculture shall have authority to establish such rules and regulations in regard to the inspection, analysis, and sale of commercial fertilizer and fertilizer material as shall not be inconsistent with the provisions of this Act, and as in his judgment will best carry out the requirements thereof.

SEC. 13. *Be it further enacted*, That nothing in this Act shall be construed to restrict or avoid sales of acid phosphate or any other fertilizer material to each other by importers, manufacturers, or manipulators who mix fertilizer materials for sale, or as preventing the free and unrestricted shipments of material to manufacturers or manipulators who have registered their brands as required by the provisions of this Act.

SEC. 14. The Commissioner shall annually analyze, or cause to be analyzed, at least one sample of every commercial fertilizer sold or offered for sale under the provisions of this Act; and he shall publish in one or more bulletins the analyses made during the year, together with relative commercial value of each commercial fertilizer computed

from its analysis, as he may determine, and the analysis guaranteed by the manufacturer. It shall be the duty of the Commissioner of Agriculture to ascertain as near as may be the actual cost of blood, tankage, fish scrap, nitrate of soda, cottonseed meal, and other materials from which ammonia or nitrogen is obtained; the cost of all phosphate rock, together with a description of the treatment with acids, the grinding and general manufacture of acid phosphate, and the actual cost thereof as near as may be; and to communicate with dealers both in this country and in Germany as to the cost of muriate of potash, kainit, and other sources of potash, and to publish the same in a bulletin. But he shall not expose to the public the name of any manufacturer in this State who may give him information on this subject, nor shall he divulge any information concerning the private business of any corporation or company manufacturing commercial fertilizers solely in this State; provided, such corporation or company is not a part or branch of any trust or combination. Said Commissioner of Agriculture shall also make and publish in every fertilizer bulletin a price list of the market value of all the materials of which commercial fertilizers are made, and revise the same as often as may be necessary. Said bulletin shall be furnished free to any manufacturer of or dealer in commercial fertilizer or fertilizer material sold within this State, and to any consumer of commercial fertilizers or fertilizer material within the State who may apply for same.

SEC. 15. *Be it further enacted*, That any person selling or offering for sale any commercial fertilizer or fertilizer material without first having complied with the provisions of this Act shall be guilty of a misdemeanor, and, on conviction thereof, shall be fined not less than \$50 nor more than \$500.

SEC. 16. To facilitate inspection of commercial fertilizers the Commissioner of Agriculture is authorized to require all manufacturers making shipments into or within the State to notify him of the kinds, amounts, dates, destinations, and consignees of all such shipments.

SEC. 17. It is hereby made a part of the duty of the director of the Tennessee Experiment Station to annually analyze, or cause to be analyzed, all samples of commercial fertilizers or fertilizer materials forwarded to him by the Commissioner of Agriculture at a uniform rate of \$5 per sample, and to further assist and cooperate with the Commissioner of Agriculture in making such practical tests of the relative value of the different commercial fertilizers offered for sale on the type soils of the State as in his judgment may be advisable.

For the purpose of carrying out this work, the Commissioner is hereby authorized to expend a sum not to exceed \$600 per annum.

The result of these investigations are to be prepared and submitted in the form of a bulletin to the Commissioner of Agriculture, who shall annually cause them to be published as a part of the bulletin giving the

analysis of the commercial fertilizers and fertilizer materials examined during the fiscal year.

SEC. 18. *Be it further enacted*, That, by the authority aforesaid, all laws and parts of laws in conflict with this Act be, and the same are hereby repealed, and that this Act take effect from and after the first day of June, 1903, the public welfare requiring it.

Passed April 9, 1903.

L. D. TYSON,

Speaker of the House of Representatives.

ED. T. SEAY,

Speaker of the Senate.

Approved April 15, 1903.

JAMES B. FRAZIER,

Governor.

RULES AND REGULATIONS.

In accordance with Section 12 of the foregoing Act, the following rules are hereby prescribed:

1. The grade of the fertilizer is to be considered a part of the "brand name or (and) trademark," and may immediately precede or follow the same, if used at all.

2. It is optional with the manufacturer whether he brands the grade on his sacks or not; but if he does brand the grade on the sacks, then the goods must conform to the requirements of the grade, as stated in Section 4 of the law.

3. In branding the word "potash" the characters, " K_2O ," heretofore in use, are to be omitted.

4. In case of goods containing 10 per cent available phosphoric acid, 0.82 per cent nitrogen, and 1 per cent potash or such mixtures as 9—1.65 or 8—0.82—3, or other combinations which do not reach a total commercial value equal to that of the standard fertilizer (which is 8—1.65—2), such mixtures are not to be designated by any grade at all. Such goods may be offered for sale and branded with any name the maker desires to give, provided such name does not indicate that they belong to a high or standard grade.

5. In printing bags containing acid phosphate only, or acid phosphate and potash, where all three ingredients of plant food are not claimed, it shall be optional with the maker whether he brands only the guaranteed ingredient—as, for instance:

Available phosphoric acid14 per cent.

Or he may brand:

Available phosphoric acid14 per cent.

NitrogenNone.

PotashNone.

But in this latter case the letters of the word "none" shall be plain and distinct and of the same size type as the name of the elements standing opposite them.

6. In the case of goods containing less than 1.65 per cent nitrogen, they may be branded as "ammoniated" goods, "guano or fertilizer," or other words implying that the same is an ammoniated superphosphate, provided they contain not less than 0.82 per cent nitrogen.

7. A goods containing 10 per cent available phosphoric acid, 0.82 per cent nitrogen, and 3 per cent potash, cannot be branded "High Grade," since it has not as high a commercial value as the legal high grade.

8. No manufacturer has the right to print the word "ammonia" at all on his sacks.

9. Manufacturers of fertilizers desiring to sell or offer their goods for sale in Tennessee must procure from the Commissioner and securely attach to each bag, barrel, or other package of fertilizer, before it leaves the factory, a certificate of inspection, or "tag," as required by Section 5 of the Act printed above.

10. No certificate of inspection, or "tag" attached to any package of fertilizer, will be recognized as valid unless the same bears the facsimile signature of T. F. Peck, Commissioner.

11. All tags must remain on the packages to which they are attached until they go to the hands of the consumer, and must not be detached by him until he is ready to use the fertilizer.

12. Ground raw bone, or meal, must contain not less than 20 per cent total phosphoric acid and 2.46 per cent nitrogen.

13. Cottonseed meal, when sold as a fertilizer, is subject to tax, and should be tagged as other fertilizers are.

14. The sale of ground raw phosphate rock is not prohibited, but is not tagged as a fertilizer by the Department of Agriculture.

RULE NO. 15.

Each and every manufacturer of commercial fertilizer doing and expecting to do business in this State, shall register each brand for the calendar year beginning with January of each year.

RULE NO. 16.

No shipment of commercial fertilizer will be made in this State except the same be in packages of 100 or 200 pounds. Shipments in bulk forbidden. Provided, that this rule in no way prohibits the shipment of fertilizer material in bulk to manufacturers for mixing purposes.

RULE NO. 17.

(Amendment to Rule 16.)

On and after February 1, 1914, acid phosphate may be shipped in

bulk in this State under the following restrictions, to-wit: requisition made by the buyer to the Department of Agriculture in the following form:

Department of Agriculture, Nashville, Tenn., T. F. Peck, Commissioner:

Please grant permit for the shipping in bulk _____ tons of _____ per cent acid phosphate from _____, located at _____, to _____, at _____.

(Signed) _____

Upon receipt of a request of this kind, the same will be placed on file, and on receipt of the following from the manufacturer the permit will be granted in duplicate, a copy furnished the manufacturer and one to the buyer:

Department of Agriculture, Nashville, Tenn., T. F. Peck, Commissioner:

Find enclosed herewith check for \$_____, to pay for fertilizer tags to be cancelled by your Department on receipt of delivery of _____ tons in bulk of _____ per cent acid phosphate to be delivered to _____, at _____, Tenn. Formal request for inspection will be mailed on receipt of permit.

(Signed) _____

Upon delivery to the buyer the following notice will be sent at once to the Department:

Received from _____, _____ tons of _____ per cent acid phosphate in bulk.

(Signed) _____

RULE NO. 18.

(Amendment to Rule 14.)

On and after February 1, 1914, raw ground phosphate rock, when sold to the farmers of this State, shall be tagged and guaranteed as other fertilizer or fertilizer materials. Bulk shipments to come under the same provisions and requirements as set out for the shipment and delivery of acid phosphate under Rule 17.

NOTE.—For cost of tags see Section 5 of the foregoing Act.

T. F. PECK,

Commissioner of Agriculture.

CAUTION.

Agents, dealers and users of fertilizers are warned against all such goods as are sent into this State without inspection tags attached. Manufacturers who are unwilling to submit their brands to analysis should not be patronized.

Furthermore, agents and dealers handling goods shipped into the State in violation of the law are liable to indictment and prosecution.

Any tags left in the possession of the manufacturers shall not be used for another season, but shall be redeemed with new tags within sixty (60) days after the close of the Department's fiscal year, which fiscal year shall be comprised between the dates of June 1 to June 1, inclusive.

Special attention is called to the above paragraph, as there have been many manufacturers who call upon us to redeem tags after we close the fiscal year.

T. F. PECK, *Commissioner*.

January 1, 1913.

WHAT SIZE SILO TO BUILD.

Farmers frequently have some difficulty in determining the correct size of silo to build. There is no question about the value of silage for feeding purposes. The immense benefits to be derived from silage are thoroughly understood, and well summed up in the Missouri Farmers' Bulletin No. 11 as follows:

1. Silage keeps young stock thrifty and growing all winter.
2. It produces fat beef more cheaply than does dry feed.
3. It enables cows to produce milk and butter more economically.
4. Silage is more conveniently handled than dry fodder.
5. The silo prevents waste of corn stalks which contain about one-third of the food value of the entire crop.
6. There are no aggravating corn stalks in the manure when silage is fed.
7. The silo will make palatable food of stuff which would not otherwise be eaten.

TABLE I.

Amount of Silage Fed Per Day.

Kinds of Stock		Daily Ration Pounds
Beef Cattle—		
Wintering calves, 8 months old.....		15 to 25
Wintering breeding cows.....		30 to 50
Fattening beef cattle 18 to 22 months old—		
First stage of fattening.....		26 to 30
Latter stage of fattening.....		12 to 20
Dairy Cattle.....		30 to 50
Sheep—		
Wintering Breeding Sheep.....		3 to 5
Fattening Lambs.....		2 to 3
Fattening Sheep.....		3 to 4

8. It enables a large number of animals to be maintained on a given number of acres.

9. It enables the farmer to preserve food which matures at a rainy time of the year when drying would be next to impossible.

10. It is the most economical method of supplying food for stock during the hot, dry periods in summer when the pasture is short.

The proper size silo to build depends upon the number of cattle

to be fed and the length of time silage is required. This period usually lasts from 180 to 240 days, although very frequently silage is fed almost the entire year.

To determine the size silo you need, refer to Table No. 1, which will give you the number of pounds in the daily ration for different stock. Figure on feeding this 180 or 200 days each year. This will tell you the number of pounds that will be consumed yearly. Divide this by 2,000 and you will find the number of tons. Table No. 2 will give you the size to build according to the number of tons you are going to feed annually.

If you are going to use it for feeding dairy cows only, Table No. 2 will give you the size to build according to the number of cows you keep, and will also tell you the number of acres of corn required to fill the silo.

TABLE II.
Approximate Capacity in Tons of Cylindrical Silos.

Depth of Silo— Feet	Inside Diameter of Silos—Feet												
	10	12	14	15	16	18	20	21	22	23	24	25	26
20	26	38	51	59	67	85	105	115	127	138	151	163	177
21	28	40	55	63	72	91	112	123	135	148	161	175	189
22	30	43	59	67	77	97	120	132	145	158	172	187	202
23	32	46	62	72	82	103	128	141	154	169	184	199	216
24	34	49	66	76	87	110	135	149	164	179	195	212	229
25	36	52	70	81	90	116	143	158	173	190	206	224	242
26	38	55	74	85	97	123	152	168	184	201	219	237	257
27	40	58	78	90	103	130	160	177	194	212	231	251	271
28	42	61	83	95	108	137	169	186	204	223	243	264	285
29	45	64	88	100	114	144	178	196	215	235	256	278	300
30	47	68	93	105	119	151	187	206	226	247	269	292	315
31	49	70	96	110	125	158	195	215	236	258	282	305	330
32	51	73	101	115	131	166	205	226	248	271	295	320	346
	10	12	14	15	16	18	20	21	22	23	24	25	26

TABLE III.

No. of Cows	Pounds Required Daily	Silage Consumed Yearly—Tons	Size of Silo Needed			Acreage Required at 15 Tons per Acre
			Diameter Feet	Height Feet	Capacity Tons	
6	240	22	9	20	22	1.5
9	360	33	10	24	34	2.4
			10	16	22	1.5
			11	22	34	2.4
13	520	42	10	28	42	2.8
			10	30	47	3.0
15	600	54	12	26	55	3.7
			14	21	55	3.7
20	800	72	12	32	74	5.0
			14	26	74	5.0
25	1000	90	12	38	94	6.4
			14	30	91	6.1
30	1200	108	14	34	109	7.3
			15	31	110	7.4
35	1400	126	16	31	125	8.4
			14	38	128	8.6
40	1600	144	18	29	144	9.4
			16	34	143	9.3
45	1800	162	18	32	166	11.0
			16	38	167	11.1
50	2000	180	18	34	171	12.1
			16	40	180	12.6

FARM BARN HINTS.

Pull the plug from the pump pipe before heavy freezing comes. It will save thawing out the pump some frosty morning, or perhaps the price of a new pump.

The cattle need not stand at an empty trough on a hot day if you pump with a gasoline engine.

If you give the boy a calf, let him do the selling, and let him use the money. A hint that he buy two or three pigs or another calf might start him right.

Oil the hayfork carrier and pulley blocks before starting to fill the mows.

Your victuals are flat if not seasoned with salt. The cattle have a sense of taste, too.

Some horses had rather stand up all night than lie on a hard, bare floor. They'll do better work next day if you bed them well at night.

Good cows are often as particular about their bed.

It costs many bushels of corn to keep poorly sheltered hogs warm with their own body heat. It's cheaper to build a warm hog house.

Pet the colt. It helps to make a gentle horse.

Your stock will look better inside a good barnyard fence.

Feed the calf warm milk direct from the cream separator. Don't forget the handful of oil meal to replace the butter fat.

Keep the cats at the barn. When the cats are away the mice will play havoc in the feed bin.

If the Monday dinner is late, perhaps the wife is doing the work of a gasoline engine in turning the washer and wringer.

You are repaid for keeping a well cultivated garden when meal time comes.

If you are having a "streak of bad luck," improve your farm management.

WEIGHTS AND HOUSEHOLD MEASURES.

45 drops of water make a teaspoonful.

1 teaspoonful equals 1 fluid dram.

1 dessertspoonful equals 2 teaspoonfuls, or 2 drams.

1 tablespoonful equals 2 dessertspoonfuls, or 4 teaspoonfuls.

2 tablespoonfuls equal 8 teaspoonfuls, or 1 fluid ounce.

1 common size wineglassful equals 2 ounces or $\frac{1}{2}$ gill.

1 common size tumbler holds $\frac{1}{2}$ pint.

A small teacup is estimated to hold 4 fluid ounces or one gill.

1 pound of wheat is equal to about a pint.

1 pound and 2 ounces of Indian meal is equal to 1 quart.

1 pound of sugar is equal to about 1 pint.

1 pint of pure water is about 1 pound.

MEASURING AND ESTIMATING HELPS.**RULE FOR MEASURING CORN.**

A heaped bushel contains 2,748 cubic inches. To find the number of bushels of corn in a crib it is therefore necessary merely to multiply together the length, width and height in inches and divide the product by 2,748. The number of bushels of shelled corn will be two-thirds of the quotient. If the sides of the crib are slanting, it will be necessary to multiply together one-half the sum of the top and bottom widths, the height and length.

RULE FOR ESTIMATING HAY.

Hay is often sold in the mow or stack where the weight has to be estimated. For this purpose 400 cubic feet of hay is considered a ton. The actual weight of 400 cubic feet of hay will vary according to the quality of the hay, time of cutting, position in the mow, etc. For making an estimate in a given case multiply together the length, breadth and height of the mow or stack in feet and divide the product by 400. The quotient will be the number of tons.

GRAIN ESTIMATES.

A wagon box ten feet long, three feet wide and 25 inches deep will hold 27.8 bushels of ear corn, or 50.2 bushels of shelled corn. A crib 10 feet wide, 10 feet high and 16 feet long will hold 711 bushels of ear corn. Of ear corn one bushel is contained in two and a quarter cubic feet. In figuring shelled corn and grain, the same space will hold one and four-fifths times as much grain as it will of ear corn. A crib that will hold 800 bushels of ear corn will hold of shelled corn or other grain 1,440 bushels.

WEIGHTS FOR BARN USE.

Frequently the farmer wishes to feed a given weight of this, that or the other stuff and has no scales at hand to weigh it. If he has a quart measure handy he can use it to measure out the required weight. The quart weight of various feeds is as follows:

Cottonseed meal, 1.5 pounds; linseed meal, old process, 1.1 pounds; gluten meal, 1.7 pounds; gluten feed, 1.2 pounds; wheat bran, coarse, .5 pound; wheat middlings, coarse, .8 pound and fine, 1.1 pounds; mixed wheat feed, .6 pound; cornmeal, 1.5 pounds; oats, 1.2 pounds; rye bran, .6 pound; H. O. dairy feed, .7 pound, and Victor corn feed, .7 pound per quart.

Common bricks are $7\frac{1}{4}$ to 8 inches long by $4\frac{1}{4}$ inches wide and $2\frac{1}{2}$ inches thick. Front bricks are $\frac{1}{4}$ inch longer and wider.

It requires 20 common bricks to lay one cubic foot. In an 8-inch wall 15 common brick make one foot of wall.

One and one-eighth barrels of lime and $\frac{5}{8}$ -yard of sand will lay 1,000 common brick.

TENNESSEE BOY "TATER" GROWERS.

The success of the boys' corn clubs and the girls' canning clubs has been attested by the hundreds of boys who have shown their fathers how to increase the yield of corn and by the hundreds of girls who have made a neat sum of pin money and had "lots of fun" raising and canning tomatoes in Tennessee.

Now comes another form of agricultural clubs for young people that will take its place with other successful innovations in making rural life more pleasant and profitable. Some boys in a Tennessee county have organized a potato club, and of their success the Louisville Courier-Journal says:

"Many of the farmers in Tennessee do not think much of the potato as a money crop. The average yield per acre for the State is eighty bushels.

"Last year some of the school boys in Cumberland County organized a potato club to see if they could not do something toward increasing the yield. They succeeded most admirably. The boy who made the best record raised 384 bushels to the acre. Another boy ran him a close race by raising 379 bushels. The average for the club was 258 bushels. All Tennessee was astonished at the results obtained by the boys.

"This year there are more potato clubs, for the showing made by the Cumberland County school boys inspired boys in other counties to try their hands at potato growing. Cumberland County, however, is still in the game and will not be easily beaten in the contest as is attested by the record made last year.

"There is not much money to be made in growing potatoes when the yield is no more than eighty bushels to the acre. But there is no necessity of persisting in that sort of potato growing. The boys have demonstrated this conclusively, thus proving that in the potato industry of Tennessee 'the child is father to the man.'"

Reports from all West Tennessee counties where potatoes are raised show that there will be a big crop despite the drouth which retarded the growth and the early winter which will make it necessary to dig early. Potatoes can be made a big and profitable crop in West Tennessee. The soil and climate are ideal. A few acres of potatoes will add a nice figure to any energetic farmer's bank account.—*Jackson Sun*.

The farmer who went to sleep ten years ago, waking up now, has to learn many new things. He is ten years behind the times. The farmer of today is ten years behind the time of the farmer ten years hence. For this reason it behooves every man to be awake to the present opportunities and to look as far into the future as he is able to do. The automobile plow and mower are almost in sight.—*Rutherford Register*.

Many cases of so-called cholera in fowls is not cholera at all, but simply lack of attention, of the right kind of food and of a good grit.

KEEP ONLY THE MONEY MAKERS.

The man who has made two blades of grass grow where but one grew before has been looked upon as a public benefactor. But the man who has succeeded in producing one blade at less cost has worked out a more complex problem.

Increased production does not always bring an increased profit. Increased profits from the dairy business must, in a measure, come from more economical production.

To reduce the cost of production we must have cows that by their breeding and individuality are adapted to our needs. For the butter and cream producing dairy, the Jersey and Guernsey cows have a certain advantage because of the character of their milk, which contains a higher percentage of butter fat.

The Holstein and Ayrshire cows are compelled to elaborate more solids to produce the same amount of fat. This is a breed characteristic.

On the other hand, the Holstein and Ayrshire cows can produce milk solids more economically and are better fitted for the production of cheese and market milk.

Within the dairy breeds we find a greater difference between individual cows than between the breeds. We are keeping too many cows. We do not know what they produce nor how much they eat. Some pay a profit and some are eating up the profits made by the others. It takes the profits from the good cows to balance the loss from the poor cows.

The first step toward reducing the cost of production is weighing and testing the milk from each cow in the herd often enough to keep a good line on what she is producing.

Weighing the milk for one day each week and testing it once each month will give practically the same results as weighing and

By taking these weekly and monthly records and making a yearly average it is easy to determine how much milk and butter each cow has produced for the year.

This is but one-half the question. Some cows are fairly large producers but not economical producers. Others may produce less milk or butter yet be more economical producers.

A light feeder may digest her food perfectly and be an economical producer. We should keep a record of each cow's feed one day each week and its market value, in connection with the weighing and testing of the milk.

This will show what a pound of milk or butter costs from each cow in the herd.

Sell the cows that produce butter for twenty-five cents per pound and keep all that produce a pound for fifteen cents. The scales, the Babcock test and pencil and paper will assist in weeding out the unprofitable cows from the herd.

One advantage possessed by bran is that it contains a fair proportion of the phosphates and fat that may be used with the ration in order to render it complete.

BOYS' PIG CLUBS BEING ORGANIZED THROUGHOUT SOUTH.

The United States Department of Agriculture has its boys' corn club and its girls' canning club, and now comes the boys' pig club, being organized in the South for the purpose of increasing the supply of pork and encouraging good breeding of hogs. Already clubs have been organized in Alabama and Louisiana, and a club organization has been started in Georgia. It is the purpose of the officials of the department to organize clubs in every Southern State.

The idea of the organization started with the Farmers' Cooperative Demonstration Branch of the department and has been carried on with the cooperation of the Animal Husbandry Division of the Bureau of Animal Industry. The organization is an off-shoot of the boys' corn club, which has an organization in every Southern State and which has been the means of producing record-breaking yields of corn. The pig club, when thoroughly organized, will, it is expected, work hand in hand with the corn club. The boys of the latter will produce the corn and the boys of the newly organized association will see to it that the pigs are produced to eat the corn.

In connection with the organization of the pig club the department makes the following statement:

"It is the purpose of the department to have every member of the club encourage not only an increased production of the swine family but a better breed of pigs than is being raised at present. It is a serious purpose the officials of the department are engaged in—one that is aimed at the high cost of living.

"The production of pork is not keeping pace with the increased population and something must be done to harmonize these two elements. If each member of the club—and they will be growing, it is expected, all the time—will see to it that one more pig and a better pig is produced each year, then a long step will have been taken in meeting the ever-growing chasm between pork production and increased population."

CONVICTS ON PUBLIC ROADS.

The Middle Tennessee Farmers' Institute is composed of men who are seeking the advancement of the agricultural interests of the State and, therefore, believe in good roads. In this they are like their brothers of the West Tennessee Farmers' Institute.

At the convention in Nashville this week the Middle Tennessee Institute adopted a resolution endorsing the working of convicts on public roads. The resolution embodied the plan suggested by Prison Commissioner J. S. Beasley that all convicts sentenced for less than three years be kept in the counties in which they are convicted and used on the road work there.

The question of convict labor in competition with free labor has long been a serious matter with the labor unions and organizations of

the country. All manner of systems have been suggested for eliminating the competition, but none seems to have met with the universal approval as the one that convicts be used on the public roads.

Any kind of convict labor will compete in a manner with free labor, but work on the roads will be about as free from free labor competition as anything they could be given to do.

The system has been tried in other States and has been highly satisfactory. It makes better men out of the convicts to give them outdoor work. The labor is not exceedingly difficult, and there is enough of it to keep all the three-year men busy for a long time.—*Jackson Sun*.

HELPING TO KEEP THE BOY ON THE FARM.

While there is an incessant and urgent cry for boys to keep on the farm instead of going to the city, much of the education gained in the average country school is calculated to make the boy yearn for the city rather than for the country. In the first place, the course of study is designed mainly by city men who are unfamiliar with rural life, and all unconsciously, perhaps, in arranging the course of study the needs of the country are almost entirely ignored. In other words, the studies, as a whole, are better fitted for the city boy than for the boy in the country.

This fact is now being recognized and the steps taken in many directions to have vocational agriculture in the country schools is a move that should have been started many years ago. As some one has very pertinently said, "In former years everything was done for the boy that was going away from his farm home and nothing was done for the boy that was going to stay at home." Fortunately that is now being changed and the instruction now being given in many a country school and in many a township high school will do wonders in making young people not only content with farm life, but enthusiastic for it.

In truth there is no study more fascinating and useful than agriculture in its various branches when it is intelligently and scientifically taught. Vocational agricultural training may well take the place for the great majority of country youths of some of the studies now in vogue which are not of the slightest practical use to nine-tenths of the pupils in their after life. Much, too much, has been made of some studies that have imparted a brilliant surface polish which has disappeared when the recipients have entered into the serious business of life.—*Humboldt Courier-Chronicle*.

HELPING THE FARMER TO HELP HIMSELF.

There is no need for any farmer to keep on farming in the same old haphazard way. A course at his State agricultural college will fill him with a strong desire to farm in the more modern way—the way which brings success. Plan to spend a few weeks or months, if possible, at the college this winter.

All of these schools have short courses for those farmers, young and old, who can not be away from home for any length of time. but in these courses, the time is so fully taken up—morning, afternoon and evening, that the wide-awake farmer can accomplish a great amount in a very short time.

A course in general agriculture is given for farmers, who do not care to specialize in any particular branch of farming, but wish to secure a better knowledge of all phases of agriculture. It includes work in soil fertility, farm management, farm crops, poultry raising, dairying in all of its branches, animal husbandry, horticulture, insect study, and plant diseases.

A study of these subjects will increase the earning capacity of every farmer.

BRIEFS FOR POULTRYMEN.

There is no sense and often much harm in drugging a whole flock to cure a few sick individuals.

Free range, plenty of shade and loose soil, good feed and clean water are essentials in the growth of young chickens. Such treatment makes large, early matured and vigorous cockerels and causes pullets to lay early and continuously.

Don't think that pure-bred chickens need to be crossed in any way to make them better. If you are not satisfied with the kind you have or the number of eggs they lay, dispose of them and get some other standard variety.

It does pay to keep thoroughbred poultry. Pays better in meat, in eggs, in growth, in satisfaction.

The Leghorns will lay fewer eggs when moulting than the Plymouth Rocks, Wyandottes or Langshans. Whatever the Leghorns do they do with a will. When they lay they shell out the eggs as though they were paid for the job, and when they moult they simply moult.

The Colorado Experiment Station says: "Alfalfa is one of the best plants to furnish green food for chickens, but ordinarily it soon kills out if overpastured. Alfalfa crowns that have been cut off and ploughed under and that have taken root again are much harder to kill out, as many have found by repeatedly grubbing out the same stool that has taken the root the second time. Such crowns seem to put out shoots from each piece of root that is left in the ground if the soil is in favorable condition.

"Those who desire to establish alfalfa in their poultry yards can succeed in this way by ploughing or spading under alfalfa crowns that have been freshly ploughed out from some field near by. Early in the spring is the best time, while the crowns are still dormant. The crowns should be covered four to six inches deep and the soil wet down and kept moist and the chickens kept off until the crowns have become established, which will be much sooner than by alfalfa seeding and will stand much harder pressure."

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IN THIS ISSUE:

The Importance of Good Seed.

Sweet Clover. Plan for Free Market Bureau

The Farmer and the Legislature.

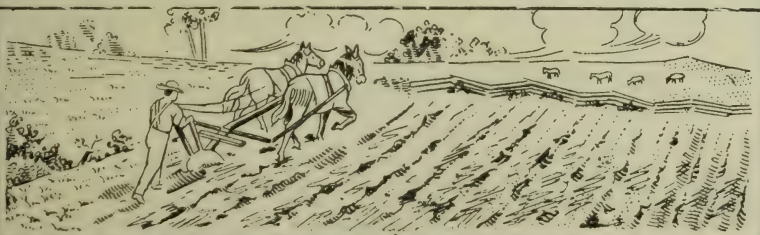
Farm Conveniences.

Intensive vs. Extensive Farming.

State Fair Board of Trustees.

Live Stock the Tennessee Farmer's Opportunity.

Diseases of Garden Crops and Their Control.



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TALKS TO FARMERS.**IMPORTANCE OF GOOD SEED.**

By T. F. PECK, COMMISSIONER OF AGRICULTURE.



The Department of Agriculture for the past three years has been doing all in its power to improve the quality of seed used by the farmers of Tennessee. Rigid inspection of seed offered by dealers has been made, and a campaign of education has been conducted with both the dealers and farmers as to the provisions of the law.

Seed time is now almost here, and we want to again emphasize the importance of careful seed selection. It will mean so much in the coming crop.

Various States have passed laws to protect the farmer from losses due to the purchase of inferior seed: in the farm crops bulletins published by our Experiment Stations and in the United States Department of Agriculture emphasis has been laid upon the importance of bestowing much study and care upon the selection of seed to be used on the farm.

With all the advancement that has been made along the line of seed improvement it can still be said that little more than a good beginning has been made. No amount of seed testing or experimental work can amount to much unless the farmer duly appreciates the fact that good seed is one of the first requisites of good farming. Ever so much attention may be given to careful and thorough preparation of a seed bed, to the feeding of the crop from an abundant supply of plant food in the soil, to maintaining a good physical condition in the soil, and to other such essentials of successful crop raising, but if the importance of good seed is not sufficiently realized, the farmer has come considerably short of the best results possible.

From poor seed we cannot expect the crop that would result from good seed, other things being equal. Thorough inquiry and careful observation will satisfy anyone that for one reason or another some

of the important details of farm work are by many given little or no attention. The seed corn is not tested before planting; the corn is not graded for the planter; the seed wheat is not run through a good fanning mill; the seed oats or wheat were not treated with formalin so as to insure the crop against smut; the clover, alfalfa or grass seed was not carefully examined for sorrel, Canada thistle, dodder or other noxious weed seeds; germination tests were not made to see what proportion of the seed would grow; through improper storing the seed is often more or less damaged by frost, mould or insects; varieties are allowed to become badly mixed, resulting in a very mongrel sort of crop which usually is far from satisfactory; through lack of familiarity with weed seed impurities and with adulterants and through lack of any analysis or guarantee attached to sacks or packages of seed offered for sale, much inferior seed goes into good farm land.

These details in the aggregate are of immense importance. Not all factors entering into the problem of increasing the yields of our farm crops can be controlled by the farmer, but over the matter of the selection of seed—corn, oats, wheat, clover, alfalfa, grass, etc.—for use on Tennessee farms, a large measure of control can be exercised. This is a matter of study and training which the right kind of a farmer will seek to acquire as a necessary part of his equipment for the business of farming. For this kind of training—training in seed selection and improvement—opportunity is offered in all our short courses, in the agricultural classes of our schools, and in the publications of various State institutions, and of the United States Department of Agriculture, and through careful observation on the part of the individual desiring the training.

Some excellent literature on seed corn has been published. Experiments have shown that our average yield per acre could be increased several bushels easily by due attention to the selection of varieties and the proper preparation of seed. The achievements of a few of our corn growers who have studied their business very carefully have attracted nation-wide attention.

Corn, wheat, and oats have comparatively large seeds, and to these crops much attention has been given during recent years. Concerning the smaller seeds—clover, alfalfa and the grasses—which are comparatively small and difficult to size up, something should be said here. 1. Good clover and grass seed will show certain definite characteristics. It will be free from the seeds of very noxious weeds, and will have few or none of even the less harmful weed seeds. 2. It will have a very small per cent (not over 2) of inert matter (grit, chaff, broken stems, etc.), if any at all. It is uncommon to find

seed wholly free of all impurities. This is what would be expected in view of the limited use of good fanning mills. 3. Good seed will all, or very nearly all, germinate and grow strongly. Much seed available for use will not give a good stand because, for one reason or another, it will not nearly all grow.

No one should think of buying fertilizer regardless of its composition and uses. No more should seed be bought without a knowledge of its real character. How is one to get at the real character of seeds offered to him? Self-dependence enters in and samples must be examined carefully at home. This is not difficult, but it requires some care and study.

What is there to hinder a farmer of average intelligence from making a collection of fifty or more of the common weeds of the farm and seventy-five or so common impurities of commercial small seeds? Why cannot a farmer with some little knowledge of seed germination and plant growth make germination tests for himself? He could easily learn to make germination and purity tests for himself. Any good farmer can see whether or not seed are plump, bright, fresh and reasonably pure, and he can easily test a seed to see whether it is strong and capable of giving a good stand or not. Any good farmer will see the possibility of improving seed by cleaning and grading it with a good fanning mill. A fairly satisfactory purity test may be made as follows:

Secure a sample of seed fairly representing the bulk lot. Mix this thoroughly with a spatula or knife. Take a tablespoonful of this seed and separate into pure seed, weed seed, adulterants (if these can be recognized) and inert matter, such as grit, chaff, broken stems, etc. Estimate as nearly as possible the proportion of each of these constituents. Identify each kind of weed seed and note the quantity of each. A little calculating will give a rough idea of the number of each sort of seed that would be scattered on a square rod or an acre, if seed of the kind being examined were sown. If suitable scales are available the work can be done much more accurately. Some study of weeds, weed seeds and other impurities is necessary, if this work is to be of real value.

To make a germination test of seed, count out 100 seeds from the pure seed pile. Take two ordinary dinner plates and a piece of cotton flannel twice as long as the diameter of one of the plates. Dampen it thoroughly and lay on a plate. Scatter the seed on the part of this cloth which rests on the plate, no two seeds touching. Folding the other half of the flannel over the seeds, invert the second plate over the first and place in a room in which the temperature does

not fall below 55 degrees at any time. In two or three days count and remove the sprouted seeds. Count and remove similarly each day thereafter till the end of the sixth or seventh day. Suppose that in all, 90 seeds have germinated. The seed is then said to have a germinating power of 90 per cent.

To be able to make purity and germination tests of small seeds is often of great advantage, as may be readily understood. Bulletin No. 428, of the Bureau of Plant Industry, U. S. Department of Agriculture, is extremely useful for those who desire further details as to small seeds and small seed testing.

In the interest of better clover and grass crops and a higher standard for Tennessee agriculture, every farmer should avail himself of all opportunities to acquire a wider knowledge of the subject of good seed and the essential differences between low and high grade seed, so that he may buy intelligently and have much greater success with clover, grass and other crops.

SWEET CLOVER.

BY T. F. PECK, COMMISSIONER OF AGRICULTURE.

During the past few weeks many inquiries have reached the Department of Agriculture as to the value of sweet clover for hay pasture or soil improvement. We have prepared the following for the information of those interested in this plant that bids fair to play an important part in the campaign for soil reclamation now getting under way:

There are two species of sweet clover, the yellow blooming variety (*melilotus officinalis*) and the white blooming one (*melilotus alba*), but only the latter one is of value as a legume. It is a biennial, starting the first year and blooming the second. Often it grows to the height of six or seven feet, and is of a wonderful luxurious green. The white blossoms, in a way, resemble the common catnip blossoms but do not grow in such large clusters.

From its striking odor the name sweet clover is given, but when the leaves or stems are tasted a peculiar bitter twang is discovered. When the plant is young it is difficult to distinguish from alfalfa, and, in fact, it is a sort of a half brother to alfalfa, for the bacteria on its roots are of the same species as is found on the alfalfa roots, and they perform the same function of gathering nitrogen from the air to enrich the soil.

Naturally, the question is asked: "If this is true, why not grow alfalfa instead of sweet clover? Alfalfa makes better hay and pasture. It will last for a number of years, and its roots contain more nitrogen. What is the advantage of sweet clover over alfalfa?" The answer is apparent when it is stated that sweet clover will grow on poor, worn-out soils on which it would be impossible to establish any other of the clover family. Its seeds thrive on soils of the hardest types where other seeds would fail to germinate. It will make a most wonderful growth on soils totally deficient in nitrogen if limestone, phosphorous and inoculation are present. On a soil of this type, sweet clover will add an enormous supply of nitrogen, for it depends wholly on its supply of this element from the air. It is also an excellent crop when used to pave the way for alfalfa because, as mentioned before, it carries the same bacteria on its roots.

Sweet clover is of value as pasturage, for when the animals become accustomed to it they will eat it ravenously. It is almost as nutritious as alfalfa. As a hay crop it cannot be recommended; the stems are too coarse and when sufficiently cured the leaves shatter in handling. By far its greatest value is as a soil builder, where the entire crop is turned under as green manure. Few have any conception of the amount of organic matter added in this way. Cyril G. Hopkins, of Illinois, cites a very interesting investigation: From one acre of sweet clover 6.4 tons of total dry matter were obtained, 228 pounds being nitrogen, and if this were turned under as a green manure crop it would furnish as much nitrogen as would be furnished by twenty-five tons of average farm manure. Another test was made on the same soil where thorough inoculation was provided, and this crop yielded approximately thirteen tons of dry matter, and the per cent of nitrogen in the inoculated plants was about one-half more than in the plants non-infected. Thus, for this enormous crop, two-thirds of the nitrogen was secured from the air. The nitrogen supplied by turning under such a crop would be sufficient to grow 100 bushels of corn per acre for five years.

In choosing the field for sweet clover one should be sure that there is sufficient limestone present. And how is one to know when lime is present? If bluegrass and clover have grown well there is no doubt plenty of lime, but if the reddish-brown sorrel or chestnut and pine trees are found this is a sure sign of deficiency. However, it is not difficult to test the soil. By the use of litmus paper one can tell if the soil is sour by burying a strip of the paper in the moist soil and letting it stay long enough for the moisture in the soil to moisten the paper. When removed if the soil is sour and needs lime

the paper will have turned from blue to red in color. Use ground limestone not less than two tons per acre.

A point too often overlooked by those who sow sweet clover is inoculation. There are millions of tiny bacteria in some soils, and they fasten themselves on the roots of growing legumes. From the air they gather nitrogen, and this in turn is assimilated by the growing plant in making its fiber, stems and leaves. They will not live in wet, sour soils but require well aerated soils with an abundance of lime present. Land on which neither sweet clover nor alfalfa has grown should be inoculated. After the seed bed has been prepared, and just before going on the land with the drill is perhaps the best time to inoculate. If there is an alfalfa field in the near vicinity, or sweet clover growing wild, it is an easy matter to procure the soil. About 200 or 300 pounds of soil, taken from the place where either of these two legumes are growing, should be distributed per acre. It should be harrowed in as rapidly as it is placed on the land as the sunlight will kill the bacteria.

It is not necessary to have a nurse crop for sweet clover in Tennessee, but it can be sown with spring oats, about sixteen to eighteen pounds of sweet clover and one bushel of oats per acre. If sown alone about twenty to twenty-five pounds. When sown with oats the oats can be mown for hay when the seed are in the dough stage. One should have a firm seed bed, not too fine but reasonably smooth. If the land is deficient in phosphate, 200 pounds of 16 per cent acid phosphate could be applied at time of seeding.

If one chooses a field with a water table too high for alfalfa or too poor to grow alfalfa, sweet clover is recommended. Although the roots of sweet clover do not grow to such a depth as alfalfa yet they draw considerable plant food from the subsoil. When they decay they offer a source of drainage, and the soil when plowed breaks up fine and friable.

There are many thousand acres in Tennessee too poor to grow paying crops of corn and alfalfa which could be profitably sown to sweet clover. While the process of soil restoration is in progress many pounds of honey, wool, mutton and beef would come from the growing crop. Considerable seed may be obtained from an acre, and it brings a price nearly equal to alfalfa seed. But, above all, its greatest value is as a soil builder. If turned over it is claimed that it will supply more organic matter, more nitrogen, and, at a minimum of cost, than any known fertilizer or legume.

PLAN FOR FREE MARKET BUREAU FOR FARMERS

BY T. F. PECK, COMMISSIONER OF AGRICULTURE.

When the producer and consumer learn that, by keeping this Department advised as to what they have for sale and what is wanted, they can be put in touch with each other, they will not be slow to take advantage of the opportunity.

The success of this free market bureau will depend on the thoroughness with which we can get it understood by the producer and consumer. We should have the cooperation of every one in this matter because its operation will injure no one and will benefit all, because it will result in much that is now going to waste finding a profitable market, keeping money in the State that is now going away, and will also result in the producer taking more pains to market his products attractively, and cause him to produce more because he can find a market for what he produces.

The plan is simple to bring buyer and seller together. They must do the rest. When the producer finds out that by writing to the Department, telling us what he has to sell, and what he can furnish at regular times, he will write us, and we will enter the information on a post card with his address, using a separate card for each product. We will file this information by subjects, labeled butter, eggs, poultry, meat, lard, pickles, preserves, fruit or whatever it might be. As inquiries come in for products wanted we will put the information as to each separate card with the address and file in a separate file by subjects, as in the "For Sale" file. Then I work my files. I find an inquiry for butter, I go to my "For Sale" file under that subject. I take the card giving the name and address of the person wanting to sell butter, and I write the address of the party wanting to buy on the side for address, and write the name and address on the card of the party wanting to sell. Both cards are mailed, and buyer and seller are put in communication.

Our first effort will be to get producer and consumer acquainted with the plan of the working of the bureau; then we propose to furnish the producer information as to methods of shipping by parcel post; where they can secure mailing cartons for eggs, butter, etc., and the cost of marketing by parcel post. Of course the marketing will not be confined to parcel post shipments, because much can be shipped by express and freight, and in many cases the producer can deliver in person their products after they have made contracts with consumers where the distance is such as will justify personal delivery.

To develop the market bureau, to make it most effective in a

large way, we propose to conduct a campaign for community cooperation, looking to the production of a better and more uniform quality of live stock, better butter, better fruits and vegetables, and in quantities that will assure the grocer and produce dealer that he can depend on the producers to supply them both the quantity and quality their trade demands. A State will not grow in wealth very rapidly that sends money outside its borders for products that could and should be produced at home. The business men and professional men prosper when the agricultural classes prosper; for that reason they can afford to lend their encouragement to a movement that will insure better production and better quality.

We have in Tennessee a committee appointed by the Tennessee Bankers' Association to encourage better production on the farm. The bankers are in close touch with the farmers of the State, and the farmers will consider seriously any suggestions coming from their banker. We expect the cooperation of the bankers in their several sections in getting the farmers interested in community cooperation in producing a quality of live stock and farm products.

When the business and professional men realize that they can help their own business by encouraging the farmer to build up his soil and increase his production and improve the quality of his products they will do much to help in the campaign for greater farm production in the State.

It has been for some years past when there was an offer to start some manufacturing enterprise in a town the business men would get together and give the movement all sorts of encouragement, such as free site, exemption from taxation, and money bonus, while the farming interests were the very foundation on which their business interests rested. This fact is beginning to dawn on the minds of the business man, and it is to be hoped, and we have reason to believe, that he will in future give to this important matter the attention and support it merits.

Now as to the free market bureau the Department of Agriculture has undertaken this work without compensation because we want to make the Department helpful in the broadest and most practical way. So to the farmer, his wife or son, or daughter, who has any product of the farm for sale that you have not a satisfactory market for, write us how much you have and how often you can furnish it. We will undertake to give you the name and address of some one wanting to buy what you have to sell.

To the consumer who wants to buy direct from the farm, if you will write us what you want, how often you want it and in what

quantities, we will undertake to give you the name and address of some one who produces and can supply you. You buy eggs, butter, vegetables, meat, lard, honey, canned goods, and many things that the farm produces. Write us and get the name of the person who can supply what you want when you want it.

THE FARMER AND THE LEGISLATURE

By T. F. PECK, COMMISSIONER OF AGRICULTURE.

In Tennessee, agriculture is the paramount industry. It is the basis not only of the prosperity of the farmers, but all of the people. We know that it has not in the past been given the encouragement its importance merits. As a result, one does not have to travel far to see the effects on the land of the indifference shown towards our most important industry.

The notion that any fool could be a farmer, and that if there was an especially bright and promising boy in the family he should be educated for a professional career, has resulted in depriving the farms of the intelligence needed in their management, and the depleted soils so much in evidence are abundant proof that every fool could not be a farmer.

Fortunately for Tennessee, some of the bright boys educated and equipped for professional careers, in their search for an opening where their professional services were needed, have learned some things that were not included in their school curriculum: That professions could be crowded until the compensation offered in many cases for their services was not more than that paid for ordinary day laborers; that more were looking for places than there are places to be filled; that while there was room at the top of the ladder for the professional man with proven ability, the foot of the ladder was so crowded that it was a hard struggle to even reach it, and many never succeeded in doing so.

When they got out in the world they learned that all the brains and bright intellects were not given to the professions; that some of it was even given to agriculture, and, most remarkable of all, was being rewarded with prosperity, influence and leadership in the affairs of the country.

The lessons they have learned have caused them to see possibilities in farming if the vocation could be given the encouragement its importance demands. Our State Departments of Agriculture have

not been given the consideration their importance merits. In many cases the men placed at the heads of these departments are not selected for their fitness for the places but rather as a reward for past political activity. In many cases, whether they are or are not qualified for the work, they are handicapped for want of funds to make their departments what they should be.

Our lawmakers must be made to appreciate the important part agriculture plays in our general prosperity, and the importance of having competent officials at the head of the departments, and to provide them with adequate funds to conduct the work most advantageously to encourage the development of the agricultural industries of the State.

Now, fellow farmers, our lawmakers are not going to bother about legislating in our interest unless we demand it of them. Other industries demand that their interests be looked after, fostered, protected and enlarged. They put into the field candidates pledged to take care of their interests, while we, as farmers, have been drifting along, letting our interests take care of themselves, and we know the result—the greatest industry in the State has received the least legislative consideration.

What are we going to do about it? The farmers of Tennessee hold the balance of power. We can get what we need to insure the development of our agricultural resources if we will indulge in less politics and use more cohesiveness and cooperation as farmers in making our demands on our lawmakers for helpful legislation.

Candidates will soon be announcing for the Legislature. Before we assure them of our support let us make known to them our demand that they give to the farmers the helpful legislation they need. We all know how solicitous they are for the farmers' vote, and how interested they are in the farmers during political campaigns when they need their votes.

If a candidate for office is in reality a good friend of the farmers, and anxious to do something for them, and has brains and ability enough to do it, he ought to have brains enough to tell the farmers before the election what he proposes to do. If he hasn't that much brains he couldn't do anything if elected.

There are a lot of things the next Legislature can do for the good of the farmers. The candidates for the Legislature who have enough brains to do these things ought to have brains enough and initiative to know what some of these things are in advance, and enough courage and candor to discuss them now.

It would be a good idea for the farmers if they would cast aside

personal preference and select men for legislative positions who stand squarely on issues beneficial to the farming interests, all else being equal. The farmers do not need or want anything that will not be for the general good of the State. In the past their interests have been neglected. If they do not look after these matters they will be neglected and disregarded the next time. When the Legislature is in session the farmers cannot be there to look after their interests. The others come. The farmers should look after the matter at home before the members are elected.

We have all heard of "the tail wagging the dog." That illustrates the attitude of the Tennessee farmers in legislative matters affecting their interests as compared to other interests. It would be nothing but common justice for the dog to wag his own tail for a while, especially when the tail is dependent on the dog for its ability to wag at all.

FARM CONVENIENCES.

BY T. F. PECK, COMMISSIONER OF AGRICULTURE.

In our weekly talks to farmers, so far, we have taken up questions that lay at the very foundation of their success. The question of soil improvement has been emphasized in every way. Cultivation of crops and fruit and vegetable growing have been discussed, also live stock breeds, feeding and their diseases. The honey bee and its importance in economic agriculture has been taken up.

Let us talk now about farm conveniences and the important part they play in our comfort, happiness and success. To cover the entire range and discuss the question on the broad line it merits would require a volume, but we will confine ourselves to the home and its arrangements for water and light.

The country home, of course, has air and light, unless these are cut off by a superabundance of shade trees too close to the house. Too many and improperly placed trees are worse than none, for the home should have plenty of air and sunlight. It is often placed too near the country road, which robs it of the comfort of privacy, and exposes it to the detrimental influences of dust and dirt. For this there is no justification.

With an entire farm to select from, there is no excuse for the improper location of the house, which should neither be placed too near the public thoroughfare nor in some valley or hollow, but on some fairly high, well drained spot. If, in selecting the building site,

a spot can be found which commands a good view of the farm and surrounding country, so much the better. If it is true that a thing of beauty is a joy forever, it is ten times true that a fine view is a joy forever. It makes a man's heart jump every time he steps out on the front porch and looks at the glorious sight. That, I think, is something worth while. There may be people who are satisfied to live under conditions which might be compared to a man trying to look through a crack in a board fence, but I must confess my utter inability to be content in such a position.

Of course we cannot all select new locations and build new homes. In many cases the location is all right if it is improved as it can be, if it is provided with an abundance of good water convenient for use. Nothing has been given less attention in the country home towards making it convenient than the water supply, and very few things add more to the comfort of the family and the convenience of the housewife than an abundance of water conveniently arranged. I could picture to you homes where the water supply today is a spring some distance away from the house, or to be drawn from a deep well with a windlass. I could also point out to you how you got your stock of mosquitoes from barrels of water caught from the roof for washing because it was soft, and the well water was too hard to wash in, and the barrels of water developed your mosquitoes. You can think of dozens of such conditions. You will find them in every community.

On most farms there are springs with sufficient fall to operate a hydraulic ram that costs very little money and with ample capacity to supply the family with an abundance of water at all times, for every purpose, and the cost of the ram and its installation could be saved in the time spent in carrying water for family needs in two years, while the equipment and many conveniences it would provide would last for many years.

Can you afford to neglect to improve the water supply when it means added comfort and convenience to every member of your family, and when the inconveniences that your boy and girl at home are contrasting with the conveniences that they see when visiting the city are the influences that may cause them to give up the country for the city.

You cannot afford to live and work under such disadvantages when you can provide the conveniences at even less cost than the city man. He must have them if he lives in the city as either owner or tenant, and he pays for them in rents or special taxes. If you have not the spring suitable for putting in the hydraulic ram, you could provide your water supply from your well with a windmill or a gaso-

line engine connected with your pump. So much labor can be saved by using gasoline engines that they are almost indispensable on any farm. They can cut your wood, shell and grind your corn, run the separator and churn your milk, cut your ensilage and stover. When it has done its day's work and night comes on it can fill your reservoir and with an inexpensive dynamo it can generate light for your home and barns, giving you all the real conveniences that the city has claimed over the country, and you can provide them with no more actual cost than if you had them in the city. So why not have them, now that we have the telephone, rural free delivery of mails, good roads and good schools and good churches in the country?

You can have all and so much more in the country. If you do not believe it, go to any of the big cities and you will find that the successful business man who has money to satisfy his ideas of comfort is going out into the country, along the good roads, and is building a home where he can have elbow room, fresh air and spacious lawns. He knows that he can have all the conveniences of the city and so much more by getting into the country. He is teaching us a lesson we might have known.

We must make our homes more attractive and more convenient if we would encourage our children to remain contented on the farm. I know that we cannot do all the things that the successful business man could do in his suburban home at first, but we can provide the conveniences gradually by utilizing time that we have wasted, and ultimately provide our home as we would have it. The business man is just realizing the home that he has been working and saving for years to build.

The trouble with us as farmers in the past has been the habit of getting along with whatever was least trouble to provide in our homes and their equipment. When we make up our minds we want to provide more conveniences for our homes we will find time and means to do it, and the added comfort and happiness we get will inspire us to better utilize our time and opportunities until we satisfactorily solve the question of home conveniences in the country.

INTENSIVE VS. EXTENSIVE FARMING

BY T. F. PECK, COMMISSIONER OF AGRICULTURE.

There appears to be a question in the minds of some people as to whether intensive or extensive farming is better for the individual farmer, the community and the country at large.

By intensive farming is meant taking a few acres, and by thorough preparation and cultivation of soil produce larger crops and more than one crop per year on the same land.

By extensive farming is meant cultivating a large number of acres with a smaller working force, which necessarily means less thorough preparation of the soil and cultivation of crops and less of the trucking crops.

Many of the people of Tennessee have been trying the extensive system with the result of washed and run-down land, unprofitable crops, with less reward for their labor each succeeding year.

The experience of so many ought to convince us that the extensive system of farming in Tennessee is not what we want.

By farming on the intensive plan we are simply developing the soil to nearer the extent of its possibility for development, and no system of farming is going to succeed that does not plan to return plant food to the soil in some form to replace that taken out in the growing of crops.

Now, I think it would be better for the farmers of Tennessee to cultivate fewer acres per laborer, and cultivate them better, with a very few exceptions. Comparatively speaking, we have just been scratching the soil, doing the things that would cause it to lose more plant food from the washing rains than from the crops grown on the land. This can be prevented by deep plowing and turning under vegetable matter, and, in doing that, making available plant food now lying dormant and unavailable in the hardpan and subsoil that should be available for growing crops.

The truck farmer is generally near some town or city where he can buy barnyard manure to keep up the supply of humus and plant food in his soil. He naturally does not require a large acreage.

The general farmer and live stock raiser requires more land that he may have pasture, meadows for hay, and fields for his corn, wheat, oats, peas, barley, etc. With the right kind of a rotation he can have all, and that portion he cultivates should not be a greater acreage than he can thoroughly prepare and cultivate at the right time and in the right way.

If our farm lands in Tennessee were divided into smaller farms and cultivated as they should be they would accommodate and profitably employ a farming population eight times the population now on them, and the production would be more than eight times what it now is. Mr. Business Man, Mr. Banker, Manufacturer and Professional Man, don't you think your business would be more profitable

if your patronage by the agricultural classes was increased more than eight times its present volume?

Brother Farmer, don't you think you could have better roads, better schools, better churches and a better community to live in if the farms were reduced in size and their producing capacity increased?

When we appreciate the fact that we can have our soils ten, twelve, or even eighteen inches deep by simply breaking up the sub-soil and getting mixed with it vegetable matter to separate the soil particles, making it porous so that the water, air and frost can penetrate it and make the plant food that has been locked up available, we will realize that we have increased the producing capacity of our farms several times; that we can sell off three-fourths of the acreage of our farms and still have greater crop producing capacity than when farming the larger area with haphazard methods. We want to get in the habit of piling up our acres instead of spreading them out. There is more money in it, more satisfaction in it, and possibilities for better advantages in every way.

MEETING OF STATE FAIR BOARD OF TRUSTEES.

At a meeting of the State Fair Board of Trustees at the Capitol on Thursday, February 12, the following recommendations to the Board were made by the Chairman, Commissioner of Agriculture T. F. Peck:

"We have assembled today to formulate the policy and plans for the 1914 Tennessee State Fair, and it goes without question that every member of the Board of Trustees wants the coming fair to be the best in its history.

"We can profit from our past experience and avoid mistakes we may have made in the past. We should keep in mind the fact that the Tennessee State Fair is intended to stimulate better methods in farm practice, better crops and better live stock produced by Tennessee farmers.

"In the past in the live stock department the show herds exhibited by professional showmen who make the circuit of the larger fairs have taken practically all the premiums offered. I have heard arguments made for open classes to the world. If we simply want an exhibit of types and breeds of live stock showing what is possible by devoting time and money without limit preparing such herds for the show ring, the policy would be justified, but if we want to encourage our own Tennessee farmers to produce thoroughbreds in a business way to supply the market demands we know that we cannot get such breeders

to enter their herds in competition with the professional showman, because it would require more time and attention than the business farmer can afford who only expects to exhibit in his own State fairs. We want to encourage more of our Tennessee live stock to be placed on exhibit and competition among Tennessee farmers. We cannot get them in competition with the professional show herds, but if we will announce to the live stock breeders of Tennessee that they will only have to meet competition from people in the State engaged in raising live stock for the same purpose they are raising theirs, let this fact be known in time and we will have all the live stock we can care for, and it will be Tennessee thoroughbred live stock, and while the exhibit may not be as perfectly groomed and abnormally fed as the herds of the professional, it will mean more to the live stock industry and it will create more interest in the live stock department of the fair. I am ready to admit that the show herds in the past have served a valuable purpose in acquainting the farmers of Tennessee with the merits of the various types and breeds, but we have had abundant opportunity to become familiar with them, and it is now time to make some showing for ourselves. It is well for us to continue to provide for the professional show herds, that our breeders may be familiar with and attain to perfection in types as they have done in Jerseys in cattle, and Berkshires, Poland-Chinas and Duroc-Jerseys in hogs. With encouragement we can confidently expect Tennessee breeders of live stock to successfully compete with the world in any breed or type. I hope you will see this matter along the same lines and give the Tennessee breeder a showing for the prize money. I think we should offer prizes for baby beef contestants something after the plan so successfully carried out at the Dallas Fair in Texas.

"In our Agricultural Department county exhibits should comprise exhibits from at least fifteen individual exhibitors. We want to encourage more of our farmers to enter competition, and the professional exhibitor will have the same effect in agricultural products by professionals as the show herds of professionals in the live stock department.

"I recommend that the woman's and children's departments be consolidated in one department, with a lady Assistant Secretary under J. W. Russwurm, our General Secretary.

"I recommend that the same provision be made for the farm boys' encampment as last year.

"I recommend that no contract be made or expenditure authorized except through the Secretary's office and with the approval of the Chairman of the Finance Committee.

"I recommend your serious consideration of the abolishment of all tickets and passes of every character, making the established entrance fee obligatory on all entering the gates excepting a prescribed number of attendants with a prescribed number of live stock, and they to have a button bradded in conspicuous places on their clothing to pass them.

"I recommend the same rigid police regulations in effect last year with special attention to a better guard of the fence line enclosing the fair grounds.

"I recommend that the racing program be made to conform to its importance in agricultural development.

"I commend the splendid management of the poultry department last year, and recommend a like provision for its conduct this year."

The Board agreed upon the following heads of departments for the 1914 fair:

Gates and Admissions—Roberts and Cayce.

Concessions—Cayce and Warren.

Amusements and Publicity—Roy and Johnsonius.

• Day Horse Show—Butler and Cooper.

Night Horse Show—Cooper and Butler.

Racing—Buford and Butler.

Dairy and Beef Cattle—Warren and DeBow.

Agriculture and Horticulture—Morgan and DeBerry.

Woman's Department—DeBerry.

Mules and Jacks—Stokeley.

Law and Order—Cooper, Peck and Johnsonius.

Educational Department—Johnsonius.

Swine and Sheep—DeBow and Warren.

Industrial Exhibit—DeBerry.

Poultry—Cooper.

LIVE STOCK THE TENNESSEE FARMER'S OPPORTUNITY.

BY T. F. PECK, COMMISSIONER OF AGRICULTURE.

The one big item of expense now, where meat is consumed, is the butcher's bill, but I am confident that the use of meat is not so general as ten years ago because the price is simply prohibitive with the man in moderate circumstances.

The assurance that the Western meat supply will grow less, and with an increasing population, together with our splendid conditions for the live stock industry, opens to the Tennessee farmers an opportunity to rebuild their land and make money from their labor

if they will engage in raising live stock. They possibly do not realize that in the last ten years the human population of continental United States increased about 21 per cent. It is very difficult to secure correct figures covering live stock population and production, but data given by the U. S. Department of Agriculture may be taken as approximately and relatively correct. Department figures show a heavy and steadily growing decrease. In brief, with human population rapidly increasing there is no corresponding increase in the meat food supply to feed them.

As against this marked decrease in production, due to purely economic reasons, we must place an increasing number of consumers and marked increase in wealth-producing power on the part of the nation at large. Appetite and demand for high-grade meats is steadily increasing. The people regard meat as absolutely necessary and essential for their well-being. If the spread between supply and demand continues at current rate meat will soon be classed among the luxuries of life entirely beyond reach of average wage earners.

The country needs more meat. Will it get it? The days of wholesale production of cattle on the open range have passed never to return in this country. Farm labor is scarce and high-priced. Increased production must begin on the small average farm. This will not be until the farmer realizes better than he does today that producing market live stock is good business sense, and that ultimately increased profits will inevitably follow persistent live stock production intelligently carried on.

It is a remarkable fact that during the last ten years, when production of live stock has been decreasing, prices for live stock and their products have been slowly but steadily advancing, so that lack of interest in the business and decreased production have not come as a result of discouraging market prices for live stock.

Why is more live stock not produced? Here are some of the benefits which come to the live stock farmer:

The live stock farmer is not dependent upon one or more grain crops of uncertain yield and price. When he has fat cattle, sheep or hogs to sell he is sure an open market is waiting every working day in the year. His live stock is the same as cash in bank, and almost anywhere can be realized upon inside of twenty-four hours. Live stock returns are not spasmodic when the business is properly handled. Further, if he is a specialty live stock farmer, his crop is ready when the supply is light and the price at the high point.

The man on the farm who sells off wheat, oats or corn is selling

raw material in which a number of men will later make a manufacturer's profit. The producer of raw material is usually relatively the most badly paid man in the line.

Growing and fattening live stock permits the continuous economical employment of farm labor, which, in a system of exclusive grain farming, is needed only at special seasons when labor is scarce and price consequently high.

Pasturing live stock and rotation of crops needed to supply them with the necessary feeds is nature's own best prescription for clean farms, free from weeds.

This same system of crop rotation, together with the growing and fattening of cattle, sheep and hogs permits in the highest degree conservation of natural soil fertility, which is the prime object of every good farmer.

Live stock in the hands of the farmer furnishes him the best possible security to be offered his local banker. When a farmer wants a little money for permanent improvements on his land, or any other legitimate purpose, bankers have found cattle paper absolutely safe and liquid in times of financial peace or panic.

Why should these things interest farmers' cooperative associations? Because such organizations have for their first and final objects the improvement of the farmers' bank account. The farmers' prosperity immediately measures the prosperity of all other producing classes. Cooperation can be and is being directly applied to the live stock industry with immediate and highly profitable results.

Cooperative ownership and use of pure bred sires for improving breeds of cattle, sheep and swine is already an accomplished fact in many communities. Many small farmers feel they cannot afford to pay relatively high prices asked for pure bred sires of approved quality.

In Denmark a system of cooperative live stock improvement has been followed for years, resulting in dairying and bacon industries in Denmark having become models for the world.

A system of cooperative live stock improvement has been successfully launched by the Canadian Department of Agriculture, as follows:

"Distribution of Pure-bred Male Animals by Department of Agriculture, Ottawa—Realizing that inability to secure the use of well-bred male animals is at the present time one of the greatest difficulties standing in the way of live stock development in many parts of Canada, particularly in the newly settled districts, the Dominion Department of Agriculture, through the live stock branch, is this year undertaking a widespread distribution of pure bred stallions, bulls, rams

and boars. The original cost of the animals will be borne by the Department, and they will be placed in the hands of such local organizations as agree to the conditions governing the distribution. In a word, these sires will remain the property of the Department, but the local associations will be responsible for their proper maintenance and management under the general supervision of officers of the live stock branch. In the case of stallions the members of the associations will also be required to pay a fee covering an annual insurance premium.

"All animals distributed will be bought from home breeders, and will be Canadian bred. As far as possible they will be purchased in the province in which they are to be placed. In this way Canadian breeders will receive encouragement, and their market will be increased not only directly but also indirectly through the emphasis given throughout the country to the value of pure bred sires. It may be added that it is not the intention to place the animals in districts where suitable males of the same class are already owned by private individuals. The aim is rather to aid sections where pure bred sires are lacking and as well to encourage new communities in following a proper and intelligent system of breeding.

"All bulls to be distributed will be purchased subject to the tuberculin test, and only stallions which have passed a rigid veterinary inspection for soundness will be selected.

"In order to take advantage of this form of assistance it is required that a number of farmers in any section shall undertake the organization of a local association in whose hands such sires as are loaned thereto may be placed. To facilitate the work and to assist those interested in completing an organization provision is made for an officer of the branch to visit the districts from which applications are received.

"Already this movement on the part of the Dominion authorities has stimulated greatly increased activity among Canadian stockmen."

The system instituted by the Ontario provincial government is indicated in a personal letter from W. B. Roadhouse, Deputy Minister of Agriculture:

"I beg to acknowledge receipt of yours of the 10th inst. in reference to the experience of this Department in the distribution of pure bred sires and the encouragement of community breeding. I am very glad to give you all the information available in reference to our experience as far as we have gone.

"About a year ago we announced a plan for the encouragement of the live stock industry in the newer settled districts of what is known

as New Ontario. The area was divided into six districts, and it was announced that we would be prepared to form four live stock associations in each of these districts. To each association with a minimum of twelve members we offered, free of charge, five rams, two boars, or a bull. The association was called upon to make its own arrangements for taking care of the animals thus placed at their disposal.

"The plan immediately attracted great interest and the number of associations was very quickly reached; in fact, some thirty associations have been organized in all these districts, and we have had a considerable demand from other points for similar organizations. During the past few months we have forwarded to the associations the following number of animals: Twenty-eight bulls, fifteen rams and two boars. These were mainly shipped this spring, and consequently, as you will readily understand, it is yet too early to have any definite information as to the further working of the plan. The idea was to assist the settler to get interested in the right types and classes of live stock, and also to develop community interest, and there are many indications that both these purposes will be accomplished to a very considerable degree.

"Since this plan has been started the Federal Government has adopted a similar scheme by which they will assist organizations in all parts of Canada by placing at their disposal male animals, including stallions, in addition to those included in our associations. They are now proceeding with their organizations, which will, of course, be largely confined to those districts which have not been supplied by private enterprise.

"In addition to the plans above outlined, there are a number of cases in the province where stallions have been purchased cooperatively and by syndicates, and these, too, I believe, have had a very beneficial effect.

"If there is any further information which we can place at your disposal we shall be very glad to do so.

"While the Government of Canada is unusually paternal in their attitude, there are several points in the Canadian system which may well be noted by this convention and carried back to the country.

"From our knowledge of the business we are satisfied you will be perfectly safe in using your best efforts to stimulate cooperative live stock improvement over the country. Live stock prices may not and probably will not remain at their present high levels, but if they drop, the prices for grain and coarse feeds will take a corresponding drop, so that the scale of live stock profits would still be very satisfactory."

I have quoted the plan the Canadian Government has adopted to

encourage more and better live stock to show the interest taken by that government. Our National Government has been working along somewhat the same lines for increasing the supply of horses for the army.

With our natural advantages for the live stock industry our own State could well afford to lend its aid to the encouragement and the development of the industry under somewhat similar lines. But farmers can solve the question themselves if they will, by community cooperation. Our banking institutions would cooperate and lend valuable aid in a feasible plan. It would mean much to Tennessee and I hope to see more interest taken by all who would be benefited by the development of the live stock industry in Tennessee.

DISEASES OF GARDEN CROPS AND THEIR CONTROL.

(This article is based on the following bulletins: No. 123, West Virginia Agricultural Experiment Station, by N. J. Giddings; No. 110, Pennsylvania Agricultural Experiment Station, by H. R. Fulton and others; No. 121, Minnesota Agricultural Experiment Station, by A. G. Ruggles and E. C. Stakman.)

Diseases of garden crops are numerous and cause large financial losses every year. It is the aim of this article to give brief descriptions of the more common diseases so that they may be recognized, and to outline methods of treatment by which they may be controlled or prevented.

Since Bordeaux mixture is the most important material yet discovered for the prevention and control of plant diseases, a few words as to its preparation and use are pertinent. It should be prepared as follows:

Place five pounds of good unslaked lime in a barrel, add water slowly until it is all slaked, and then add enough more water to make twenty-five gallons in all. The mixture should be well stirred all the time while adding the water and must be allowed to cool before mixing with the copper sulphate.

Measure into another barrel twenty-five gallons of water and add to it five pounds of copper sulphate (bluestone). It is best to place the copper sulphate in a piece of coarse cloth such as sacking and let this hang in the barrel so that the sulphate is just below the surface of the water. It dissolves much more quickly when suspended in this way than when allowed to lie at the bottom of the barrel. Each barrel should be fitted with a molasses gate about one and one-half inches in diameter and should have a short trough leading from this gate to a small tub or box which in turn has a trough leading

to the spray tank. The box or tub should be covered with a cheese cloth strainer to keep out lumps.

When the lime mixture has cooled, stir it thoroughly and open the gates on both the lime barrel and the copper sulphate barrel. Regulate these gates to have about the same stream come from each, and so that both barrels are emptied at the same time. The materials come together on the strainer, forming Bordeaux mixture. It is necessary to keep stirring the materials on the strainer with one hand most of the time as the little lumps collect on the cloth and clog it. The lime mixture must be stirred almost constantly while it is running out because it settles very quickly.

If it is desired to use the spray against insect enemies as well as fungous diseases, Paris green may be added to the mixture at the rate of one-half pound to fifty gallons, or arsenate of lead at the rate of three pounds to fifty gallons. The insecticide should be mixed up in a little water before it is added to the Bordeaux so as to avoid lumps.

There are several other formulæ for Bordeaux mixture, some calling for four pounds of lime and four pounds of copper sulphate, others for six pounds of lime and four pounds of copper sulphate to the fifty gallons of water. The amount of lime, however, is always equal to or greater than the amount of copper sulphate, and in any case the proper method of preparation is that described above. The practice of adding strong lime mixture to dilute copper sulphate solution usually gives good results, but the method here outlined is generally regarded as better.

STOCK SOLUTIONS

Stock solutions are frequently used and save considerable time and trouble. The best way to make up these solutions is to use one pound of material to one gallon of water, so that in the case of a stock solution of copper sulphate containing thirty pounds of the sulphate there would be thirty gallons of water. In the same way the lime after being slaked would have water added to it until it contained at the rate of one gallon of water to one pound of lime. For use, one gallon of the stock solution would be diluted with four gallons of water, and the lime mixture must be thoroughly stirred each time before taking any from the barrel.

When Bordeaux mixture is properly prepared, one can hardly apply too much. In case of doubt as to the amount to use on any crop it is well to apply as much as the leaves will carry without dripping.

There are various appliances for spraying plants, and one must be governed largely in his choice of machine by the amount of spraying to be done. For outdoor work the barrel pump is probably the most useful and the most economical for the small grower. When one endeavors to apply Bordeaux mixture to an outdoor crop in a field of half an acre or more, using a knapsack sprayer, the amount used will seldom be sufficient for good results. The knapsack sprayer, bucket spray pumps, etc., are designed more for greenhouses and small gardens or for the use of a strong insecticide solution. Large growers would, of course, do well to consider the purchase of a power sprayer. One of the greatest difficulties with the power sprayers now on the market is that they do not apply a sufficient amount of Bordeaux.

ASPARAGUS.

Rust.—This disease may be recognized by the reddish or black spots on the stems and branches in midsummer or later; the tops yellow prematurely. It may be avoided to a large extent by planting on soil which is not too dry and by maintaining a high degree of fertility. At the end of the season all affected plants should be burned. No plants should be allowed to mature during the cutting season.

BEAN.

Anthracnose.—This disease attacks all parts of the bean plant, producing on the pods sunken scab-like spots. It is carried over from one season to another in the seed. Hand sorting of the seed, discarding any beans which show signs of the disease, is not recommended, but by selecting pods free from disease spots and using seed from these good results may be secured. Some growers have found it profitable to spray with Bordeaux mixture first when plants have broken through the ground, again when first leaves have expanded and a third time soon after blossoms have fallen. All diseased plants should be collected and burned after harvesting the crop.

Rust.—The rust spots appear on the leaves, and occasionally on the pods, as brown powdery masses. The best method of controlling this trouble is to burn all diseased plants after harvesting the crop.

Blight.—The blight is a bacterial disease producing large dead spots in the leaves and sometimes forming depressed watery spots on the pod. This disease is carried over in the seed, so that care should be taken to secure healthy seed. Spraying with the Bordeaux mixture is said to reduce the injury.

BEET.

Leaf Spot.—The fungus causing this disease produces on the leaves numerous spots having a purple border and a gray center. It may be controlled by spraying with Bordeaux mixture when plants are five to six inches high and at intervals of about two weeks.

BLACKBERRY AND RASPBERRY.

Rust.—The rust is readily recognized by large orange-colored spots on the leaves. These spots are usually on the under side. The fungus lives over from year to year in the canes so that all diseased plants should be taken out and burned.

Anthracnose.—This disease is frequently quite destructive. It produces small gray scab-like spots on the canes. All diseased canes should be removed and burned. Spraying with Bordeaux mixture will help to prevent it, but ordinarily this would not pay.

CABBAGE, CAULIFLOWER AND TURNIP.

Club Root.—This disease is well known from the peculiar irregular enlargement of the roots. A field in which the disease has been present should not be planted to cabbages for several years, and should be kept free from kale, wild turnip, etc., as the fungus lives upon these plants. If it is impossible to avoid planting in an infected field, the ground should be limed in the fall at the rate of fifty to seventy-five bushels per acre. The seedlings should certainly be started in uninfected soil and if such cannot be secured in any other way, the soil may be well baked or steamed before using. Guard against carrying infected soil or manure to uninfected spots.

Black Rot.—This disease may be recognized by the dark discoloration of the veins or fibers of the leaves or stems. It is frequently carried on the seed. It is well to disinfect the seed by soaking in formalin at the rate of one pint of formalin to twenty gallons of water, or in corrosive sublimate solution at the rate of one ounce of corrosive sublimate to seven gallons of water. Seed should be soaked about fifteen minutes. Use clean soil for the seed bed. All cabbage refuse should be removed from infested fields and destroyed, and cabbage or related plants prevented from growing there for several years. If the disease appears, control insects that may spread the bacteria and destroy badly affected plants.

CELERY.

Early Leaf-Blight.—Plants may develop this disease in the seed

bed, and it is most prevalent in early summer. Keep young plants coated with Bordeaux mixture, later using the non-staining ammoniacal copper carbonate solution. Well-drained, half-shaded fields seem to suffer less than others.

Hcart-Rot.—This trouble seems to be of bacterial origin. It would seem advisable to destroy affected material, store carefully, rotate crops and disinfect seed.

Leaf-Spot.—This disease affects celery stalks as well as leaves, and causes rot in storage. Affected areas are dotted with minute black specks, which distinguish it from early blight. Spray the plants thoroughly with Bordeaux as a preventive. Avoid introducing diseased material into storage, and give careful attention to the ventilation, moisture and temperature of storage places.

CUCUMBER.

Anthracnose.—This appears as brownish spots on the leaves, and occasionally causes a rot of the young cucumbers. Spray with 3-4-50 Bordeaux every two weeks after vines begin to run.

Bacterial Wilt.—Scattered plants wilt gradually without evidence of injury to stem or roots. The sap tubes are filled with a milky, stringy mass of bacteria instead of the water sap. Various insects spread the bacteria in their feeding. Keeping the plants covered with 3-4-50 Bordeaux mixture will make them distasteful to such insects, and so lessen the spread. Cut out and destroy affected parts promptly, and practice rotation of crops.

Downy Mildew.—The leaves become yellow and die without wilting; and on the under side there is a downy fungous growth with dark metallic luster. It develops late in summer, but spreads rapidly. Continue the use of Bordeaux mixture, substituting ammoniacal copper carbonate to avoid staining the fruit. Try to spray the under side of the leaves thoroughly.

EGGPLANT.

Anthracnose.—This disease attacks the fruit, producing pits of various sizes. When serious, it may be controlled by spraying with Bordeaux mixture or with ammoniacal copper carbonate.

Leaf Spot.—This may be recognized by the brown spots which occur on the leaves. Spraying with Bordeaux mixture is advisable for the control of this disease. Plants should not be grown on ground where the disease has occurred the previous year.

GOOSEBERRY.

Mildew.—A grayish white growth occurs on the fruit and leaves of diseased plants. This disease is very destructive upon some varieties. It may be largely controlled by setting the plants where there will be good circulation of air and cutting out the lower drooping branches. Spraying with potassium sulphide about once in ten days from the time the buds open until the fruit is gathered is quite effective in controlling it.

GRAPE.

Black Rot.—This frequently causes quite severe losses in the grape crop. It produces small brown spots on the leaves, but is most serious upon the fruit, where it appears as small decayed spots which spread rapidly until the entire grape is discolored and shrunk. These shrunk or "mummied" grapes carry the disease over from one year to the next and care should be taken to carefully gather and destroy all such. Wet weather or grass or weeds around the vines favor the development and spread of this disease, so that clean cultivation should be practiced if possible. Thorough spraying with Bordeaux mixture will do much to prevent its development and spread. Begin when the shoots are eight inches long and make five or six applications in all. For the late applications use ammoniacal copper carbonate, or neutral copper acetate.

Anthracnose.—This disease produces brown spots on the leaves or stems, or, in case the fruit is attacked, scabs with bright colored borders. It may be readily controlled by thoroughly spraying with Bordeaux mixture.

Downy Mildew.—Leaves attacked by this disease show first lighter green and then yellow spots above, while underneath there are white downy patches. It also attacks the fruits, covering them with a whitish growth and stopping their development. It may be controlled in the same manner as the black rot.

MELON.

Leaf Blight.—These are small brown spots that enlarge and run together. They show target-like markings, and the dead tissue is apt to break from the centers. Leaves die, and the fruit ripens prematurely and is of poor quality. Satisfactory control results from thorough spraying as for anthracnose. Resistant strains have been developed.

Anthracnose, Bacterial Wilt and Downy Mildew.—See under cucumber.

ONION.

Mildew or Blight.—The fungus causing this disease produces gray spots on the leaves, and these enlarge until the entire leaf may be covered. It is sometimes quite destructive, especially upon young plants. After the disease has appeared in a field, onions should not be grown there for at least two years. Bordeaux mixture is quite effective in controlling this disease, but it must contain some adhesive to make it stick to the leaves.

Smut.—This may be recognized by the dark dusty streaks which appear on the leaves, or sometimes on the bulbs. It is most often destructive on young seedlings. The fungus persists in the soil, and infection is from this source, and can affect sprouting seeds only. Transplants or sets, if grown on clean soil originally, will not afterwards contract the disease. Formalin, diluted at the rate of one pint to thirty gallons of water, and applied to the seed just before covering, by means of a drip attachment on the seeder, has been found quite valuable in preventing this disease. One gallon of this solution is sufficient for about 400 feet of drill. A mixture of fifty pounds of lime and 100 pounds of sulphur applied in the drills is also a good preventive. This mixture should be applied at the rate of 150 pounds per acre.

PEA.

Mildew.—This produces a white coating on both sides of the leaves, and such leaves soon become yellow and die. It may be largely controlled by spraying with Bordeaux mixture, but the amount of damage is not ordinarily great enough to warrant going to much expense for spraying.

Anthraxnose.—This appears as small reddish spots on the leaves, pods or stalks. It frequently causes a considerable amount of loss. Spraying with Bordeaux mixture will generally help to prevent the disease.

POTATO.

Dry-Rot.—Affected tubers show a brown discoloration of the fibrous ring if cut across at the stem end. In storage they shrivel and slowly rot. The fungus lives in the soil, attacks the feeding roots first and later enters tubers through their stems. If severely attacked, plants wilt and die suddenly; at other times they change color slowly as though ripening prematurely. Infected land should not be planted to potatoes for several years. Disinfect seed potatoes

as for scab before they are cut. Examine by cutting the stem end and reject all discolored ones. Use up an affected crop promptly, or store at a temperature near 40 degrees F. in a dry place.

Early Blight.—Definitely outlined circular brown spots with target-like markings develop anywhere on the leaflets and enlarge gradually, the rest of the leaflet becoming yellowed. Spray thoroughly with 4-4-50 Bordeaux mixture, beginning when the plants are six or eight inches high. Repeat at intervals of two weeks, increasing the strength to 6-6-50 for the third and later applications. Usually five applications will suffice. Control insects. Clean up trash.

Late Blight.—The leaflets rot quickly, there is a downy fungous growth on the under side, and a disagreeable odor is emitted. Tubers rot in the field and in storage with a kind of dry rot. Spray as for early blight, excepting that the two or three earliest applications are not needed for this disease. Do not plant tubers from an affected crop.

Scab.—This disease is caused by a soil fungus that may persist for several years. It is spread by planting scabby tubers. Because the infection is superficial, danger can be avoided by disinfecting seed potatoes before cutting by soaking for two hours in formalin, one pint to thirty gallons, or in corrosive sublimate, four ounces to thirty gallons. Select the smoothest potatoes for this treatment. On a large scale, formaldehyde gas disinfection has proven satisfactory. A clean crop will not be produced unless clean seed is planted in clean soil. The fungus develops more and persists longer in alkaline soils than in neutral or slightly acid ones. Lime, wood ashes and barnyard manure favor scab; green manuring and most chemical fertilizers hinder its development. In any case a rotation of several years' length should be followed on infested land.

Soft Rots.—Several soft or wet rots commonly affect tubers in the field or after storage. They seem to be caused in each case by bacteria, and are not to be confused with the *fusarium* or *phytophthora* dry rot, although they often follow these as well as scab injury. Dig the potatoes as soon as possible, if wet weather prevails and they have been grown in heavy soil. Store in a dry, cool, well-ventilated place. Rotate crops and avoid using seed potatoes from affected hills. If possible, use hardy strains.

Tip-Burn or Leaf-Scorch.—This condition is often mistaken for the fungous blights. It is purely a functional disorder, resulting from lack of sufficient moisture supply for the leaf, and is marked by the dying and curling of the leaflets from the tips or margins. A check

after rapid growth, drought, insect bites, or root disease may cause this symptom. Increase the water-retaining capacity of the soil by deep plowing, addition of humus and frequent shallow cultivation in dry weather. Plant deep and control insects.

SQUASH.

The squash is subject to the same diseases as the cucumber and methods of control are the same.

STRAWBERRY.

Leaf-Spot.—The spots are gray with purplish borders. The disease is more serious on old beds. It is best controlled by making new plantings from sound plants well away from infected beds. If necessary, spray with 4-4-50 Bordeaux mixture at any time after the plants have become established. Old beds may be mowed after picking, the leaves raked thoroughly and burned, and the new growth protected with Bordeaux mixture. Varieties vary in susceptibility.

TOMATO.

Rust or Leaf-Spot.—Tomato leaves affected with this show numerous small brown spots. The disease sometimes causes quite serious loss in the production of tomatoes, since affected leaves finally dry up and die, and the fruit from such vines is of inferior quality and size. The Bordeaux mixture spray is the best known preventive for this disease.

Bacterial Blight or Wilt.—This is similar to the bacterial wilt of the potato and the best methods of treatment are the destruction of biting insects and growing plants on soil where the disease has not been present for two or three years.

Fungus Blight.—This disease causes the leaves to die, beginning with the lower ones and continuing upward along the stock. The stem when cut across shows darkened veins. The fungus which causes the disease lives over in the soil from year to year, so that the best method of treatment is to keep infested soil free from tomatoes for at least three years after a crop showing the disease has been there.

Fruit-Rots.—End-rot of the fruit sometimes starts independently of any organism through apparent failure of the tissues to develop properly. Lack of water during fruiting is an important causal factor; and the loss can be reduced by supplying water, or by cultivating to conserve soil moisture.—*Market Growers' Journal.*

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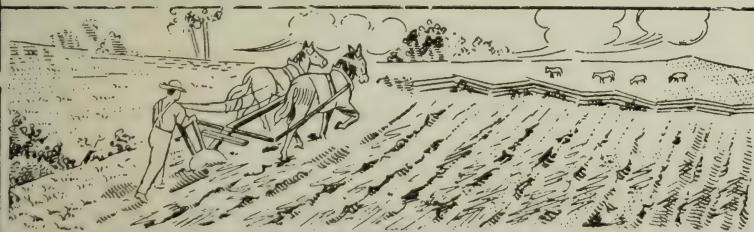
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IN THIS ISSUE:

CONCENTRATED
COMMERCIAL FEEDING STUFFS.

Bulletin No. 5.



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TENNESSEE BULLETIN

TABULATED ANALYSES OF CONCENTRATED FEED STUFFS

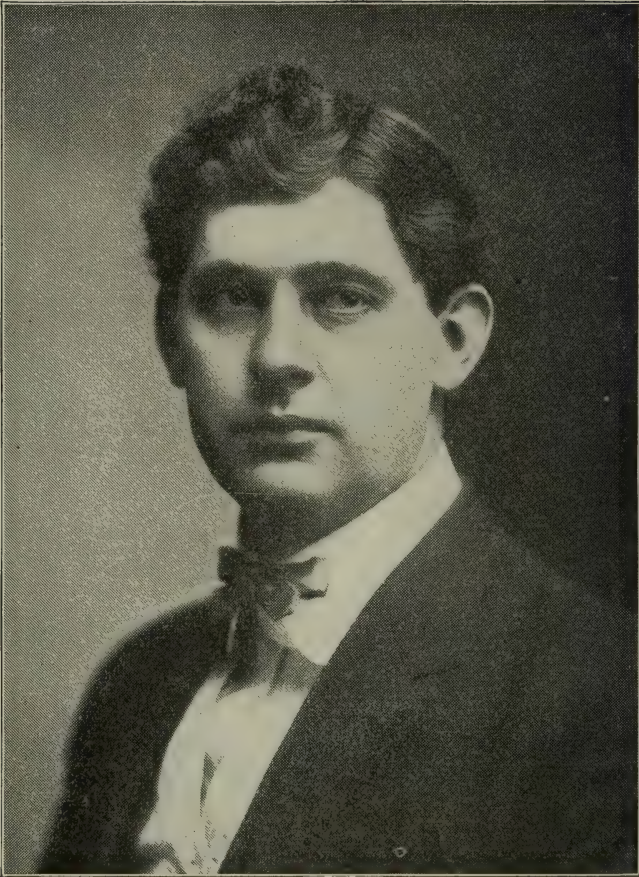
From Samples Drawn in Ac-
cordance with the Law, by the
Department of Agriculture

From January 1, 1913, to January 1, 1914

T. F. PECK, Commissioner

COMPILED BY
J. W. SAMPLE, State Chemist
AND
A. L. GARRISON, Chief Feed Inspector

This Bulletin Furnished Free Upon Application to this Department



A. L. GARRISON
CHIEF FEED INSPECTOR

CONCENTRATED COMMERCIAL FEED STUFFS.

**Report of the Chemist on Official Samples Furnished by
the Department of Agriculture to February 1, 1914.**

COMPILED BY A. L. GARRISON, CHIEF FEED, SEED AND FERTILIZER
INSPECTOR, AND J. W. SAMPLE, STATE CHEMIST.

(Feeding Stuff's Bulletin No. 5.)

If all of the live stock were owned by the farmer, or kept on the farm, the feeding question would resolve itself into the simple proposition of the farmer raising enough feed to supply the needs of his stock, and we would have no need for the feed manufacturer and his products. But such a condition does not and never can exist. The liveryman, the transfer man, the contractor and numerous other stock owners and users, who cannot produce feedstuff of any kind, are the ones who are dependent upon the feed manufacturers, and are the ones who should derive the greatest benefit from the enforcement of the feed control laws.

Prior to the passage, in 1907, of the feed control laws, the consumers of commercial feeding stuffs in Tennessee were at the mercy of the feed manufacturers and dealers, and had no protection whatever.

While there have always been many honest feed manufacturers and dealers who conscientiously tried to give the consumer his money's worth, there have been others who had no such scruples, and in consequence Tennessee became the dumping ground for the inferior products which could not be sold in states having feed control laws.

ADULTERATED FEEDS AND STOCK POWDERS.

Before the passage of our feed control laws such products as ground corncobs, oat hulls, chaff, ground peanut hulls, etc., were quite plentiful on the Tennessee markets, being mixed in with some good feeding material and put on the market under some high-sounding trade name calculated to mislead the consumer. Where the consumer thought he was getting a concentrated feed of high nutritive value, he was in reality getting a material whose chief constituent was indigestible woody matter, or crude fibre, and which was not worth the freight as a feeding material.

When such feeds were used, and the stock began to "run down," losing their appetites and getting thin, there were other unscrupulous manufacturers—for example, the condimental stock food men—standing ready and waiting to enrich themselves at the expense of the consumer. These people put on the market, under wonderful guarantees, mixtures of some good feedstuffs, such as linseed meal, bran,

wheat and corn products, to which had been added small quantities of some cheap drugs and other foreign materials, claiming for such mixtures the most marvelous curative properties.

The agents of the manufacturers of these nostrums were ever ready to prescribe their goods as a sure cure for whatever ailment the stock might have, in many cases the same remedy being prescribed for both diarrhea and constipation. Usually all that the supposed sick animal needed was feed of proper nutritive qualities, which it was not getting, due to adulteration of the commercial feedstuff that was being fed. Fancy names were applied to these stock powders, and they commanded fancy prices, and if they would do only a small part of what is claimed for them by the manufacturers they would be well worth the price.

CONSUMER PROTECTED.

Thanks to the passage of the state and national pure food and drugs acts, the consumer is no longer a prey to the stock food and stock powder man, and now when he thinks his stock is in need of such materials as copperas, Epsom salts, charcoal, saltpetre, sulphur or any of the common remedies, he goes to the drug store and gets what he needs at a decent price, instead of having to pay fifty or a hundred times as much for the same material in the form of a stock powder.

Since the passage of the feed control laws in Tennessee the quality of the feedstuffs offered for sale has shown a steady improvement, each year's inspection showing a marked improvement over the preceding year, until we have now reached the point where we can safely say that Tennessee is comparatively free from adulterated feedstuffs, and the consumer as a general rule is getting his money's worth when he buys a bag of feed bearing the stamp of the Tennessee Feed Inspection. This condition could never have been attained by the unaided efforts of the Department of Agriculture, and was brought about through the cooperation of the honest dealers and the consumers working with the same end in view.

VIGILANCE SHOULD NOT BE RELAXED.

Because the 1913 feedstuffs inspection shows the conditions of the feed trade in the state to be on such a high plane is no reason why vigilance on the part of anyone should be relaxed, and it is the earnest desire of the Department of Agriculture that the dealers and consumers of the state continue to cooperate with the department in maintaining the high standard which has been reached. And this standard cannot be maintained without such cooperation.

If anyone, be he manufacturer, dealer or consumer, finds a feed on the Tennessee markets which he has reason to believe is not all that is claimed for it, or which does not bear the proper tag and stamp, it is his duty to report the case to the Department of Agriculture. All such cases reported will be at once investigated, and where the law is being violated, the proper steps for the correction of the evil will be taken.

The 1913 inspection shows a few instances where the guaranteed analysis is not what it should be for a feed of the given composition. In such cases the manufacturers have been advised to change their guarantees. Errors of this character are due to ignorance on the part of the manufacturer, and to failure to have chemical analyses of his products made from time to time.

It is the opinion of this department that every manufacturer should have an analysis of each different brand of feed made at least once a year. In this bulletin will be found tables giving the average composition of the materials most commonly used in making up feed mixtures. By the intelligent use of these tables and careful weighing anyone should be able to compound a mixed feed of approximately any desired composition.

FEEDING VALUE.

The feeding value of a feedstuff is dependent upon the amount of digestible matter that it contains. All feedstuffs contain a certain amount of indigestible matter which passes through the body of the animal without doing anything to sustain the animal. Therefore, a desirable concentrated feed is one that contains the smallest amount of indigestible and the largest amount of digestible matter. The amount of any ingredient of a feed digested by an animal depends upon the proportions of the other ingredients which are being fed along with it. Thus, if carbohydrates are fed in too large a proportion, a considerable part of them will be evacuated without nourishing the animal, and be wasted.

The digestion coefficient of any ingredient of any feed is simply that per cent of it which goes to nourish the animal, and varies for different animals. A cow will digest more of the fibre of a feed than a horse will digest. In this bulletin will be found a table of digestion coefficients for the different feed ingredients in the feeds most commonly used. To apply the table, multiply the percentage of each ingredient, as found by analysis, by the proper coefficient of digestion for that ingredient as shown by the table, and divide the product by 100; the result will be the number of pounds in 100 pounds of the feed, of protein, fat, fibre, etc., as the case may be, that the animal can naturally digest. Feeders will find this table of great value in the calculation of rations.

Generally speaking, it may be stated that the protein, fat and carbohydrates are the digestible constituents of a feed, and that the crude fibre is the indigestible portion. Therefore, in making an analysis of a feedstuff, these four constituents are determined, and the value of the feed estimated from the figures so obtained.

PROTEIN.

Protein is of complex composition, being made up of the elements carbon, hydrogen, oxygen, nitrogen and sulphur, combined in varying proportions, and generally speaking, includes all of the nitrogenous matters of the feedstuff which resemble in composition and properties

the white of an egg, lean meat and curd of milk. Since protein is of similar composition to the lean meat or muscles and tissues of the animal body, it is very readily assimilated, going to build up the flesh, muscles, hair, hoofs, horns and all of the other nitrogenous parts of the animal body. Under certain conditions protein may go to the production of fat in the animal body, but this is not its natural function.

All nitrogenous materials are of high fertilizing value, and as all of the proteids of the food are not retained in the body, the surplus being passed out as manure, it would seem good economy to use feeds of high protein content from the fact that at the same time that the animal body is being strengthened and built up a valuable fertilizer is being produced. Protein is the highest in price of any of the feed constituents, and the commercial value of a feedstuff is largely dependent upon its protein content, but when we consider the fact that we get double use of the protein (the feeding as well as the manure values) it is economy in the end to use rich protein feeds.

In this connection, the following table compiled by the Virginia Department of Agriculture is of interest in that it shows the advantage to the farmer in growing feeds rich in protein:

COST OF PROTEIN.

\$100.00

Alfalfa	\$ 6.25 per ton.....	3,520 pounds protein
Clover	5.00 per ton.....	2,720 pounds protein
Skimmed milk	3.00 per ton.....	2,000 pounds protein
Cottonseed meal	28.00 per ton.....	2,150 pounds protein
Gluten meal	26.00 per ton.....	1,960 pounds protein
Oil meal	30.00 per ton.....	1,953 pounds protein
Dried blood	60.00 per ton.....	1,750 pounds protein
Bran	24.00 per ton.....	1,023 pounds protein
Shorts	26.00 per ton.....	939 pounds protein

From this table you will see that \$100.00 spent in growing alfalfa will yield you 3,520 pounds of protein, while the same amount of money spent in buying shorts will give you only a little over one-fourth as much, or 939 pounds.

FAT.

The fat, or ether extract, of a feed includes everything that can be extracted from the moisture-free material by ether, and consists of liquid and solid fats, oils, waxes, coloring matter, etc. The fat of a feed is twofold in its functions, in that it may be directly assimilated to produce animal fat, and at the same time serve for the production of heat and energy in the animal body. The energy produced by the digestible fat in a feedstuff is about 2.4 times as great as the energy produced by the same weight of carbohydrates.

CARBOHYDRATES.

Strictly speaking, the carbohydrates of a feed include the nitrogen-free extract and the crude fibre, but in common practice the latter is

determined and reported separately, and the term carbohydrates as commonly used includes the sugars, starches, gums, organic acids and pentosans. Like fat, the digestible carbohydrates may serve for the production of the non-nitrogenous parts of the body, and for the generation of heat and energy.

CRUDE FIBRE.

Fibre is the essential constituent of the walls of the vegetable cells which go to make up the structure of the plant, and as all feedstuffs are of vegetable origin it naturally follows that all feeds contain more or less crude fibre. Cotton fibre and paper pulp are good examples of fibre in its nearly pure state. Fibre is the most indigestible ingredient of a feedstuff, and its importance as a nutrient is negative.

ASH.

All feeding materials contain more or less mineral matter extracted from the soil by the plants from which the feed is made. This mineral matter remains behind as ash when the feed is burned, and consists chiefly of lime, magnesia, potash and soda combined with chlorine, carbondioxide, sulphuric and phosphoric acids. These mineral substances are essential to the processes of nutrition and assimilation in the animal body, as well as an absolute necessity for the building of bones. Since practically all natural feeding stuffs contain sufficient amounts of these mineral constituents, the feeder rarely ever considers them in making up his ration.

DIGEST OF TENNESSEE FEED LAW.

Administrative Officer.—Commissioner of Agriculture, Nashville, Tenn.

Inspection Fee.—Twenty cents per ton.

Materials Requiring Registration.—All feeds used for live stock or poultry except whole hays, straws and corn stover where not mixed with other materials; unmixed whole seeds or grains or cereals when not mixed with other materials.

Materials Requiring Registration But Not Inspection Fee.—Unadulterated wheat, corn, rye and buckwheat bran, middlings or shorts.

Power to Fix Standards, Rules and Regulations.—Power to fix rules and regulations for administration of law, also for the grading of feeding stuffs.

Standards Fixed.—Weights 5, 8 1-3, 10, 25, 50, 75, 100, 125, 150, 175, 200 pounds. Definitions for several materials have been adopted.

Information Required to Appear on Packages.—(a) Weight of package; (b) name, brand or trade-mark; (c) name and address of manufacturer, jobber or importer; (d) percentage of crude protein; (e) percentage of crude fat; (f) percentage of carbohydrates; (g) maximum percentage of crude fibre; (h) names of ingredients.

Goods Sold in Bulk or in Packages Belonging to Purchaser.—Sufficient tax stamps must be delivered to cover sale. Purchaser must be furnished with card giving above information.

Manner of Appearance of Information on Packages.—Must appear on tag attached to package. May also appear in the form of printing on package.

Materials Prohibited.—Any substance injurious to the health of domestic animals, any foreign, mineral or other substance, such as rice chaff or hulls, peanut shells, ground or crushed corn cobs, oat hulls or similar materials of little or no feeding value.

Procedure Necessary to Secure Registration.—Consult administrative officer and carefully follow his instructions.

Registration Permanent or Annually.—Annually, on or before January first or before goods are offered for sale.

Deposit of Samples.—Not necessary unless requested.

Registration May Be Refused.—It may under certain conditions.

Registration May Be Cancelled.—It may under certain conditions.

Manner of Collection of Samples for Analysis.—Sample of not less than one pound to be collected from not less than ten packages if there be that many in the lot.

Materials Subject to Seizure.—Yes; sale may be suspended pending investigation as to legal sale.

Notice or Hearing Before Prosecution.—Must give thirty days' notice in writing to manufacturer, importer, agent or jobber if same be known.

Penalty for Violation.—Not more than \$50 for first violation; not more than \$200 for each subsequent violation.

Remarks.—The Commissioner of Agriculture in his discretion may release any feeding stuffs seized or withdrawn from sale when the requirements of the provisions of the statute have been complied with and all costs and expenses incurred in any proceeding connected with such seizure or withdrawal have been paid.

FEED DEFINITIONS.

Definitions of terms adopted by the Association of Feed Control Officials of the United States, adopted November 17 and 18, 1911, and November 19, 1912:

Alfalfa-meal is the entire alfalfa hay ground, and does not contain an admixture of ground alfalfa straw or other foreign materials.

Blood-meal is ground dried blood.

Brewers' dried grains are the proper dried residue from cereals obtained in the manufacture of beer.

Buckwheat-shorts or buckwheat-middlings are that portion of the buckwheat grain immediately inside of the hull after separating from the flour.

Choice cottonseed meal must be finely ground, not necessarily

bolted, perfectly sound and sweet in odor, yellow, free from excess of lint, and must contain at least 40 per cent of protein.

Chop is a ground or chop feed composed of one or more different cereals or by-products thereof. If it bears a name descriptive of the kind of cereals, it must be made exclusively of the entire grains of those cereals.

Clipped oat refuse (term oat clippings not recognized) is the resultant by-product in the manufacture of clipped oats. It may contain light, chaffy material broken from the ends of the hulls, empty hulls, light, immature oats and dust. It must not contain an excessive amount of oat-hulls.

Corn-bran is the outer coating of the corn kernel.

Cornfeed-meal is the sifting obtained in the manufacture of cracked corn and table-meal made from the whole grain.

Cornstarch by-product with bran is that part of commercial shelled corn that remains after the separation of the larger part of the starch, the germ and the bran by the processes employed in the manufacture of starch and glucose. It may or may not contain corn solubles.

Cornstarch by-product without bran is that part of commercial shelled corn that remains after the separation of the larger part of the starch, the germ and the bran by the processes employed in the manufacture of starch and glucose. It may or may not contain corn solubles.

Cottonseed feed is a mixture of cottonseed meal and cottonseed hulls, containing less than 36 per cent of crude protein, and shall be plainly marked, "Mixture of cottonseed meal and cottonseed hulls."

Cottonseed meal is a product of the cottonseed only, composed principally of the kernel with such portion of the hull as is necessary in the manufacture of oil; provided, that nothing shall be recognized as cottonseed meal that does not conform to the requirement above set forth, and that does not contain at least 36 per cent of protein.

Cracklings are the residue after partially extracting the fats and oils from the animal tissue. If they bear a name descriptive of their kind, composition or origin, they must correspond thereto.

Digester tankage is the residue from animal tissue exclusive of hoof and horn specially prepared for feeding purposes by tanking under live steam, drying under high heat, and suitable grinding. If it contains any considerable amount of bone, it must be designated digester meat and bone tankage.

Distillers' dried grains are the dried residue from cereals obtained in the manufacture of alcohol and distilled liquors. The product shall bear the designation indicating the cereal predominating.

Flax plant by-product is that portion of the flax plant remaining after the separation of the seed, the baste fibre and a portion of the shives, and consists of flax-shives, flax-pods, broken and immature flax-seeds and the corticle tissue of the stem.

Good cottonseed meal must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color and must contain at least 36 per cent of protein.

Grits are the hard, flinty portions of Indian-corn without hulls and germ.

Hominy-meal, hominy-feed, or hominy-chop, is a mixture of the bran coating, the germ and a part of the starchy portion of the corn kernel obtained in the manufacture of hominy grits for human consumption.

Malt-sprouts are the sprouts of the barley grain. If the sprouts are derived from any other malted cereal, the source must be designated.

Meal is the clean, sound, ground products of the entire grain, cereal or seed which it purports to represent. Provided, that the following meals, qualified by their descriptive names, are to be known as, viz: Corn germ-meal is a product in the manufacture of starch, glucose and other corn products, and is the germ layer from which a part of the corn-oil has been extracted. Linseed-meal is the ground residue after extraction of part of the oil from the ground flax-seed.

Meat-scrap and meat-meal are the ground residues from animal tissue exclusive of hoof and bone. If they contain any considerable amount of bone, they must be designated meat and bone scrap, or meat and bone meal. If they bear a name descriptive of their kind, composition or origin, they must correspond thereto.

Oat-groats are the kernels of the oat berry with the hulls removed.

Oat-hulls are the outer chaffy coverings of the oat grain.

Oat-middlings are the floury portions of the oat-groat obtained in the milling of rolled oats.

Oat-shorts are the covering of the oat grain lying immediately inside the hull, being a fuzzy material carrying with it considerable portions of the fine floury part of the groat obtained in the milling of rolled oats.

Prime cottonseed meal must be finely ground, not necessarily bolted, of sweet odor, reasonably bright in color, yellow, not brown or reddish, free from excess of lint, and must contain at least 38.6 per cent. protein.

Red dog is a low grade wheat flour containing the finer particles of bran.

Rice-bran is the cuticle beneath the hull.

Rice-hulls are the outer chaffy coverings of the rice grain.

Rice-polish is the finely powdered material obtained in polishing the kernel.

Screenings are the smaller imperfect grains, weed seeds and other foreign material having feeding value, separated in cleaning the grain.

Shipstuff of wheat mixed feed is a mixture of the products other than the flour obtained from the milling of the wheat berry.

Shorts or standard middlings are the fine particles of the outer and inner bran separated from bran and white middlings.

Wheat-bran is the coarse outer coatings of the wheat berry.

Wheat white middlings, or white middlings, are the part of the offal of what is between the shorts or standard middlings and the red dark.



J. W. SAMPLE
STATE CHEMIST

WHEAT BY-PRODUCTS.

Chemist's Number	INSPECTOR	Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS							
						FOUND				GUARANTEED			
						Protein	Fat	Fibre	Carbo-hydrates	Protein	Fat	Fibre	Carbo-hydrates
510 White			Pure Wheat Shorts.	Garrison Valley Mills, Wartrace, Tenn.	Garrison Valley Mills, Wartrace, Tenn.	16.50	4.63	2.73	63.16	17.00	5.50	3.00	55.00
826 Stout		79	Bran	Harlan & Lowe Milling Co., Bardwell, Ky. ...	Cooper & Swarengen, Greenfield, Tenn.	15.71	4.70	7.45	56.75	14.22	4.43	4.80	52.00
825 Stout		78	Wheat Bran	Dahnke-Walker Milling Co., Union City, Tenn.	Dahnke-Walker Milling Co., Union City, Tenn.	13.86	4.03	7.35	59.18	14.00	4.00	9.50	55.00
824 Stout		77	Wheat Shorts	Dahnke-Walker Milling Co., Union City, Tenn.	Dahnke-Walker Milling Co., Union City, Tenn.	16.23	4.26	4.80	60.33	14.50	4.00	6.00	60.00
822 Stout		75	Mixed Bran	Dyer Milling Co., Dyer, Tenn.	Dyer Milling Co., Dyer, Tenn.	14.74	4.30	6.60	59.36	14.48	5.12	7.83	61.13
820 Stout		73	Wheat Middlings	Forked Deer Roller Mill Co., Trenton, Tenn. ...	Forked Deer Roller Mill Co., Trenton, Tenn. ...	15.09	4.68	6.12	53.13	15.36	4.75	6.33	57.61
811 Wynn		121	Pure Wheat Bran	J. M. Veach & Co., Adamsville, Ga.	A. King & Dickey Co., Etowah, Tenn.	16.50	4.22	6.42	58.85	14.50	4.00	9.50	.....
808 Wynn		118	Bran and Shorts	Branner Mills, Jefferson City, Tenn.	Branner Mills, Jefferson City, Tenn.	15.36	4.04	4.28	63.30	15.00	4.00	7.50	55.00
804 Wynn		114	Bran and Shorts	Williams Bros., Maryville, Tenn.	Williams Bros., Maryville, Tenn.	15.80	5.00	6.58	59.06	14.50	4.50	8.00	55.00
803 Wynn		113	Pure Wheat Bran and Shorts	A. C. Atchley, Maryville, Tenn.	J. N. Badget & Co., Maryville, Tenn.	16.32	4.68	6.53	58.47	14.50	4.00	8.00	55.00
797 Wynn		107	Pure Winter Wheat Bran	Standard Tilton Milling Co., St. Louis, Mo. ...	Lewis & Adcock, Knoxville, Tenn.	17.11	4.54	8.69	53.84	14.50	4.00	9.50	54.00
792 Wynn		102	Jersey Cream Shorts	Newport Milling Co., Loudon, Tenn.	McDaniel & Ault, Knoxville, Tenn.	14.30	2.85	5.63	63.31	13.00	4.00	8.00	60.15

788	Wynn	98	Palace Bran	Kehler Flour Mills Co., St. Louis, Mo.	16.06	4.53	10.18	53.01	14.00	3.50	10.00	54.00
778	Wynn	88	Shorts	Eagle Flouring Mill Co., Sweetwater, Tenn.	14.14	4.33	3.55	54.98	14.50	4.50	5.50	60.05
775	Wynn	85	Bran	Eagle Flouring Mill Co., Sweetwater, Tenn.	14.39	4.50	9.10	57.49	14.00	4.00	8.50	54.00
772	Wynn	82	Ballard's Bran	Ballard & Ballard, Louisville, Ky.	15.45	3.87	9.53	55.43	14.50	4.10	9.00	53.00
764	Wynn	74	Pure Wheat Bran	Enid Mill & Elevator Co., Enid, Okla.	19.04	3.82	7.60	54.57	14.50	4.00	11.00	....
763	Wynn	73	Pure Wheat Mid- dlings	Igleheart Bros., Evansville, Ind.	17.64	5.87	4.98	57.41	15.00	4.00	6.00	60.00
762	Wynn	72	Pure Wheat Bran	Igleheart Bros., Evansville, Ind.	15.45	4.60	8.78	54.52	14.50	4.00	9.50	....
750	White	96	Wheat Shorts	McLemore, Crutcher & Co., Nashville, Tenn.	14.92	2.95	2.51	68.80	15.00	4.00	5.00	52.00
746	White	92	Mixed Bran	W. M. Neville, Arlington, Ky.	15.27	4.22	6.85	60.94	15.43	3.50	....	....
745	White	91	Fox Brand	Obion Mill & Elevator Co., Obion, Tenn.	15.97	3.95	6.43	60.85	13.72	4.09	58.10	....
744	White	90	Pure Winter Wheat Bran	Standard Tilton Milling Co., St. Louis, Mo.	17.64	4.73	8.79	54.87	14.50	4.00	9.50	54.00
734	Wynn	67	Pure Wheat Bran and Screenings	Liberty Mills, Nashville, Tenn.	17.90	4.50	7.22	56.31	14.50	4.00	9.50	50.00
732	Wynn	65	Pure Wheat Mid- dlings	Domestic Flour Milling Co., Kansas City, Mo.	16.41	4.90	6.20	59.34	15.00	4.00	7.00	56.00
729	Wynn	62	Winter Wheat Mid- dlings	National Feed Co., St. Louis, Mo.	16.06	4.92	8.33	56.27	16.00	4.00	7.00	56.00
727	Wynn	60	Wheat Bran	Fayetteville Milling Co., Fayetteville, Tenn.	15.09	4.24	7.92	58.06	14.50	4.00	6.50	55.35
724	Wynn	57	Pure Winter Wheat Middlings	Cairo Milling Co., Cairo, Ill.	15.27	4.92	9.43	54.78	15.75	4.75	5.00	57.95

WHEAT BY-PRODUCTS—Continued.

Chemist's Number	INSPECTOR	Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS					
						FOUND			GUARANTEED		
						Protein	Fat	Fibre	Carbo-hydrates	Protein	Fat
720	Wynn	53	Winter Bran	Hunter-Robinson-Wenz Mfg. Co., St. Louis..	Dan C. Wheeler & Co., Chattanooga, Tenn.	15.09	4.29	9.72	55.50	14.50	4.00
719	Wynn	52	Pure Wheat Bran..	Middle Tenn. Milling Co., Tullahoma, Tenn.	Dan C. Wheeler & Co., Chattanooga, Tenn.	16.32	4.40	7.78	57.08	14.50	5.00
718	Wynn	51	Pure Wheat Bran..	Shelton Mills, Chattanooga, Tenn.	Dan C. Wheeler & Co., Chattanooga, Tenn.	15.09	4.41	9.80	55.04	14.50	4.00
714	Wynn	47	Shorts	Cedar City Mills, Lebanon, Tenn.	Farmers' Hay & Grain Co., Harriman, Tenn..	14.92	3.75	4.82	64.35	14.00	4.50
710	Wynn	43	Bran and Shorts	Newport Milling Co., Newport, Tenn.	Newport Milling Co., Newport, Tenn.	16.06	4.50	6.85	58.27	14.50	4.00
703	Wynn	36	Wheat Bran	J. S. Read, Morristown, Tenn. ..	J. S. Read, Morristown, Tenn. ..	16.15	4.82	8.20	55.96	14.50	4.00
708	Wynn	41	Pure Wheat Bran..	Padgett & Foncher, Cosby, Tenn.	W. B. Robinson, Newport, Tenn.	16.94	4.34	6.94	57.68	14.50	4.00
702	Wynn	35	Wheat Shorts	J. S. Read, Morristown, Tenn. ..	J. S. Read, Morristown, Tenn. ..	17.11	5.14	5.30	58.64	15.00	4.50
694	Stout	68	Pure Winter Wheat Middlings	Standard Tilton Milling Co., St. Louis, Mo....	L. A. Thornton & Co., Memphis, Tenn.	18.25	4.54	5.62	39.33	15.00	4.00
682	Stout	56	Bran	Gates & Donnelson Co., Memphis, Tenn.	W. D. Moon & Co., Memphis, Tenn.	15.18	4.30	7.52	58.79	13.25	3.70
681	Stout	55	Bran Feed	West Tennessee Mills, Gleason, Tenn.	West Tennessee Mills, Gleason, Tenn.	14.92	4.86	6.45	58.56	16.00	4.75
678	Stout	52	Feed Shorts	McKenzie Milling Co., McKenzie, Tenn.	McKenzie Milling Co., McKenzie, Tenn.	16.94	4.82	2.25	63.31	15.00	3.09

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676	Stout	50 Bran	J. H. Ward & Co., Greenfield, Tenn.	J. H. Ward & Co., Greenfield, Tenn.	14.83	4.50	6.67	59.46	15.00	3.75	6.00	57.95
675	Stout	.....	49 Wheat Bran and Shorts	E. R. McCabe & Co., Jackson, Tenn.	E. R. McCabe & Co., Jackson, Tenn.	15.62	4.65	7.22	57.11	16.08	3.92	6.24	58.39
648	White	.....	84 Wheat Bran	Lawrenceburg Mfg. Co., Lawrenceburg, Tenn..	Lawrenceburg Mfg. Co., Lawrenceburg, Tenn..	15.53	3.95	8.65	56.73	14.50	4.00	8.00	50.00
649	White	.....	85 Wheat Brand and Shorts	Augustine Bros. & Co., Loretto, Tenn.	Augustine Bros. & Co., Loretto, Tenn.	14.83	3.45	5.55	63.05	14.00	4.00	8.00	50.00
647	White	.....	83 Wheat Bran and Shorts	Lawrenceburg Mfg. Co., Lawrenceburg, Tenn.	Lawrenceburg Mfg. Co., Lawrenceburg, Tenn.	15.01	3.44	5.18	62.73	14.50	4.00	8.00	50.00
645	White	.....	81 Shorts	Maury Milling Co., Mt. Pleasant, Tenn. ..	Maury Milling Co., Mt. Pleasant, Tenn. ..	14.92	4.21	4.80	63.05	14.62	4.70	5.30	54.38
643	White	.....	79 Wheat Bran	Ashwood Roller Mills, Ashwood, Tenn.	M. S. King, Columbia, Tenn.	14.83	4.36	8.12	57.89	14.50	4.00	8.50	58.75
536	White	.....	72 Supposed to be Wheat Bran	Bunch Roller Mills, Columbia, Tenn.	Dale Feed & Grain Co., Columbia, Tenn.	15.45	3.81	9.35	55.89	.....	.....	.....	.....
621	Stout	.....	14 Feed Bran	McKenzie Milling Co., McKenzie, Tenn.	G. W. Adams & Co., Trezevant, Tenn.	15.09	3.77	9.33	56.52	15.31	4.32	6.67	58.22
619	Stout	.....	12 Bran	Stafford Milling Co., Martin, Tenn.	A. Stafford, Martin, Tenn.	15.18	4.60	7.77	57.47	15.56	4.73	7.78	69.69
617	Stout	.....	10 Wheat Bran and Screenings	Dunlop Milling Co., Clarksville, Tenn. ...	L. D. Hunt, Humboldt, Tenn.	14.22	3.80	8.70	56.53	14.75	4.65	9.50	57.50
616	Stout	.....	9 Pure Wheat Shorts.	C. Becker Milling Co., Red Bud, Ill.	Hamilton Bros., Humboldt, Tenn.	16.94	4.95	4.90	60.56	15.50	4.20	8.00	57.00
614	Stout	.....	7 Feed Bran	Paris Milling Co., Paris, Tenn.	Hawkes & Duffey, Humboldt, Tenn.	15.36	4.20	7.85	58.38	14.31	4.58	7.61	57.50
612	Stout	.....	5 Bran	Humboldt Milling Co., Humboldt, Tenn.	Hawkes & Duffey, Humboldt, Tenn.	15.35	3.82	8.90	57.67	14.00	3.75	10.00	52.00
611	Stout	.....	4 Feed Bran	Milan Milling Co., Milan, Tenn.	Milan Milling Co., Milan Tenn.	15.36	3.75	9.80	56.73	12.20	3.48	7.10	58.00
604	Wynn	.....	28 Wheat Bran and Shorts	Babb Mill Co., Afton, Tenn.	N. A. Hawkins & Sons, Greeneville, Tenn. ..	14.74	3.51	6.15	61.71	15.00	4.00	8.00	.....

WHEAT BY-PRODUCTS—Continued.

Inspector's Number	INSPECTOR	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS									
					FOUND				GUARANTEED					
					Protein	Fat	Fibre	Carbo-hydrates	Protein	Fat	Fibre	Carbo-hydrates		
603	Wynn	.....	27	Bran and Shorts	Greenville Milling Co., Greenville, Tenn. ..	Ellenberg & Pates, Greenville, Tenn. ..	16.94	4.83	7.80	55.07	15.00	4.00	8.00	55.00
601	Wynn	.....	25	Pure Wheat Bran and Wheat Shorts	Kendricks Creek Flouring Mill, Fordtown..	P. T. White, Jonesboro, Tenn.	14.74	3.58	5.55	61.96	14.00	3.50	7.50	55.00
595	Wynn	.....	19	Rich Middlings	Model Mill Co., Johnson City, Tenn. ..	L. L. Goodwin, Houston, Tenn.	16.06	4.53	7.32	57.02	15.02	4.00	7.20	60.40
573	White	.....	64	Middlings	H. C. Cole Milling Co., Chester, Ill.	By mail	16.85	4.35	3.28	61.71	15.00	4.50	8.00	57.00
571	White	.....	62	Pure Wheat and Brown Middlings.	Dunlop Milling Co., Clarksburg, Tenn. ...	Dunlop Milling Co., Clarksburg, Tenn. ...	16.32	5.32	4.62	59.07	16.25	4.60	6.00	62.50
569	White	.....	60	Mixed Bran	Hislie's Roller Mill, Murfreesboro, Tenn..	Hislie's Roller Mill, Murfreesboro, Tenn..	13.78	3.93	3.20	64.14	13.59	4.62	7.76	52.00
563	White	.....	55	Wheat Bran	Valley Mill Co., Petersburg, Tenn. ..	A. M. McLaughlin & Sons, Fayetteville ...	14.39	3.82	5.50	61.25	14.10	4.69	5.61	54.10
560	White	.....	52	Ship Stuff	Wilhoit's Mill, Wilhoit, Tenn.	Wilhoite's Mill, Wilhoite, Tenn.	12.55	2.56	2.12	70.49	13.78	2.56	2.16	52.00
559	White	.....	51	Wheat Bran and Screenings	Fayetteville Milling Co., Fayetteville, Tenn. ..	R. O. Thornton & Co., Fayetteville, Tenn. ..	14.83	4.37	7.05	58.55	14.50	4.00	6.50	55.35
558	White	.....	50	Wheat Bran	Hamilton Mills, Coldwater, Tenn. ...	A. M. McLaughlin & Sons, Fayetteville ..	14.04	3.25	4.40	65.23	13.57	4.62	7.76	52.00
557	White	.....	49	Pure Ship Stuff	D. Farr, Franklin, Tenn.	D. Farr, Franklin, Tenn.	17.11	5.44	3.92	59.46	17.11	5.11	4.07	59.81
554	White	.....	46	Mixed Bran	Wilhoite's Mill, Wilhoit, Tenn.	Wilhoite's Mill, Wilhoite, Tenn.	14.39	4.53	6.60	60.00	15.75	4.22	8.35	56.31

536	White	29	Wheat Bran	J. A. & O. L. Jones M. & E. Co., Nashville, Tenn.	J. A. & O. L. Jones M. & E. Co., Nashville, Tenn.	14.65	4.27	8.37	56.54	15.50	4.00	8.00	55.00
532	White	25	Feed Shorts	McKenzie Milling Co., McKenzie, Tenn.	J. E. Tidwell, Dickson, Tenn.	14.83	4.11	2.58	66.48	15.00	3.09	1.12	69.20
529	White	22	Shorts	Cedar City Mills, Lebanon, Tenn.	Cedar City Mills, Lebanon, Tenn.	15.71	4.17	3.32	62.86	14.00	4.50	7.50	56.00
528	White	21	Bran	H. C. Cole Milling Co., Chester, Ill.	Dodson Grain Co., Lebanon, Tenn.	15.88	4.15	8.05	56.91	14.50	4.50	9.00	54.00
524	White	17	Wheat Bran and Ships	A. Waller & Co., Corydon, Ky.	Dodson Grain Co., Lebanon, Tenn.	15.80	4.40	7.76	56.42	14.50	4.00	8.00	55.00
523	White	16	Wheat Bran and Screenings	Universal Milling Co., Lebanon, Tenn.	Universal Milling Co., Lebanon, Tenn.	13.95	4.60	8.35	58.65	12.90	4.82	8.10	.....
519	White	13	Pure Wheat Bran.	Liberty Mills, Nashville, Tenn.	Acme Stock & Poultry Sup. Co., Nashville ..	13.95	3.93	10.95	53.42	14.50	4.00	9.50	50.00
518	White	12	Pure Wheat Shorts.	Liberty Mills, Nashville, Tenn.	Acme Stock & Poultry Sup. Co., Nashville ..	17.29	5.08	6.60	56.38	16.00	4.00	6.00	48.00
517	White	11	Pure Wheat Bran.	Dunlop Milling Co., Clarksville, Tenn. ..	Wynn Bros., Dickson, Tenn.	15.97	4.01	9.22	54.90	14.75	4.00	9.50	57.50
516	White	10	Wheat Bran	Dahne-Walker Milling Co., Union City, Tenn.	McEwen Milling Co., McEwen, Tenn.	14.65	3.20	8.95	57.44	14.50	4.00	9.50	55.00
512	White	6	Mixed Bran	Garrison Valley Mills, Wartrace, Tenn.	Garrison Valley Mills, Wartrace, Tenn.	15.27	5.87	8.28	56.06	14.94	4.13	7.30	58.31
511	White	5	Mixed Bran	Garrison Valley Mills, Wartrace, Tenn.	Garrison Valley Mills, Wartrace, Tenn.	16.50	5.90	3.70	59.57	12.25	5.25	8.25	58.31
564	White	56	Bran and Screenings	Belfast Milling Co., Belfast, Tenn.	Lewisburg Grain Co., Lewisburg, Tenn.	14.30	3.50	7.87	57.12	13.50	7.20	8.50	52.18
723	Wynn	56	Shelton Mill Bran.	Shelton Mills, Chattanooga, Tenn...	Dan C. Wheeler, Chattanooga, Tenn. .	15.36	4.29	7.14	59.15	16.50	4.50	8.50	57.03
531	White	24	Feed Bran	McKenzie Milling Co., McKenzie, Tenn.	J. E. Tidwell, Dickson, Tenn.	15.09	4.20	9.02	55.92	15.81	4.32	6.37	58.22
677	Stout	51	Feed Bran	McKenzie Milling Co., McKenzie, Tenn.	McKenzie Milling Co., McKenzie, Tenn.	15.27	4.76	9.05	55.03	15.81	4.32	6.67	58.22

WHEAT BY-PRODUCTS—Continued.

Chemist's Number	INSPECTOR	Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS									
						FOUND				GUARANTEED					
						Protein	Fat	Fibre	Carbo-hydrates	Protein	Fat	Fibre	Carbo-hydrates		
639	White	.....	75	Pure Shorts	.....	Dechard Milling Co., Dechard, Tenn.	S. M. Shelley & Sons, Dechard, Tenn.	14.92	4.12	6.60	60.74	15.00	4.75	4.25	62.39
642	White	.....	78	Pure Wheat Bran	.....	Dechard Milling Co., Dechard, Tenn.	S. M. Shelley & Sons, Dechard, Tenn.	13.60	3.42	11.05	56.40	14.19	4.32	9.40	53.09
821	Stout	.....	74	Bran	.....	Forked Deer Roller Mill Co., Trenton, Tenn...	Forked Deer Roller Mill Co., Trenton, Tenn...	13.78	4.52	8.31	56.22	15.27	4.51	7.34	56.23
646	White	.....	82	Wheat Bran	.....	McLemore, Crutcher & Co., Nashville, Tenn.	J. T. Fittenberry (farmer), Mt. Pleasant ...	13.86	2.89	6.90	60.11	15.00	5.00	9.00	60.00
537	White	.....	30	Pure Wheat Shorts.	.....	J. A. & O. L. Jones M. & E. Co., Nashville, Tenn.	J. A. & O. L. Jones M. & E. Co., Nashville, Tenn.	14.48	4.05	3.15	65.88	17.00	5.50	6.00	60.09
508	White	.....	2	Wheat Middlings	.....	Riverside Milling Co., Shelbyville, Tenn. ...	Riverside Mill Co., Shelbyville, Tenn. ...	15.36	3.72	3.30	63.66	18.64	6.00	3.27	60.42
582	White	.....	71	Wheat Bran and Shorts	.....	Portland Milling Co., Portland, Tenn.	Portland Milling Co., Portland, Tenn.	13.25	3.89	7.38	61.01	15.00	4.00	8.00	55.00
561	White	.....	53	Shorts	.....	Lillie Mill Co., Franklin, Tenn.	Lillie Mill Co., Franklin, Tenn.	14.30	3.83	4.67	63.02	15.97	4.58	6.41	58.29
562	White	.....	54	Bran	.....	Lillie Mill Co., Franklin, Tenn.	Pointer & Co., Franklin, Tenn.	13.34	3.84	8.95	57.55	15.31	4.00	8.76	48.63
555	White	.....	47	Pure Wheat Shorts.	.....	City Mill & Grain Co., Columbia, Tenn.	City Mill & Grain Co., Columbia, Tenn.	14.22	3.96	4.65	62.70	16.00	4.75	6.00	54.00
553	White	.....	45	Pure Wheat Shorts.	.....	Columbia Mill & Elev. Co., Columbia, Tenn.	Columbia Mill & Elev. Co., Columbia, Tenn..	14.92	3.70	5.95	60.09	15.50	5.30	6.00	58.00
556	White	.....	58	Pure Wheat Bran and Screenings	.....	Columbia Mill & Elev. Co., Columbia, Tenn.	Columbia Mill & Elev. Co., Columbia, Tenn..	13.51	3.60	9.38	56.09	14.50	4.00	9.50	54.00

608	Stout	.....	1	Wheat Shorts	.....	Stafford Milling Co., Martin, Tenn.	13.95	3.00	1.17	69.75	17.11	5.51	5.18	59.19
641	White	.....	77	Pure Wheat Bran..	.....	Winchester Milling Co., Winchester, Tenn.	13.69	3.63	8.55	59.69	14.50	4.00	9.50	.....
693	Stout	.....	67	Valier's Brand	.....	Valier & Spies Milling Co., Marine, Ill.	15.53	5.25	8.36	56.66	17.00	5.00	5.00	55.00
637	White	.....	73	Pure Shorts	.....	Winchester Milling Co., Winchester, Tenn.	12.46	2.59	2.35	62.65	15.00	4.00	6.00	.....
568	White	.....	59	Middlings	.....	Trenton Milling Co., Trenton, Ill.	16.15	5.14	2.55	63.22	.....	.....	.....	.....
572	White	.....	63	Pure Wheat Shorts.	.....	Jones Roller Mill, Murfreesboro, Tenn.	13.25	3.49	1.18	69.33	.....	.....	.....	.....
567	White	.....	58	Wheat Bran	.....	Trenton Milling Co., Trenton, Ill.	14.83	4.02	8.25	56.12	.....	.....	.....	.....
566	White	.....	57	Wheat Bran	.....	Jesse Walling Mills, McMinnville, Tenn.	14.74	4.52	6.55	58.92	13.69	4.89	.....	.....
530	White	.....	23	Pure Wheat Bran..	.....	Cedar City Mills, Lebanon, Tenn.	14.92	4.40	12.26	51.82	.....	.....	.....	.....

MIXED FEED.

Chemist's Number	INSPECTOR	Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS							
						FOUND				GUARANTEED			
						Protein	Fat	Fibre	Carbo-hydrates	Protein	Fat	Fibre	Carbo-hydrates
782 Wynn	92	Jasco Feed	J. Allen Smith & Co., Knoxville, Tenn.	Hackney Feed Co., Knoxville, Tenn.	14.83	4.06	7.00	59.39	14.50	4.00	8.00	56.09
781 Wynn	91	Tex Feed	Early & McDaniel Co., Cincinnati, Ohio	Hackney Feed Co., Knoxville, Tenn.	12.02	3.91	2.32	70.07	10.00	2.50	5.00	60.99
776 Wynn	86	Tip Top Feed	Madisonville Flouring Mills, Madisonville ..	E. L. McCampbell, Sweetwater, Tenn. .	14.30	4.42	6.25	61.76	14.60	4.20	7.60	53.40
774 Wynn	84	Everbest Stock Feed	Athens Roller Mills, Athens, Tenn.	Geo. Crow, Athens, Tenn.	15.27	3.95	8.70	56.96	15.00	4.00	9.20	53.00
773 Wynn	83	Swanay's Mixed Feed	Vonore Mills, Vonore, Tenn.	Geo. Crow, Athens, Tenn.	13.95	4.87	7.18	60.68	12.00	3.50	8.50	55.00
771 Wynn	81	Vere-Best Feed ...	Sykes Milling Co., Cleveland, Tenn.	M. L. Beard, Cleveland, Tenn.	16.50	4.69	5.40	58.92	14.50	4.30	6.50	55.00
769 Wynn	79	Mixed Feed	Rapier Sugar Feed Co., Owensboro, Ky.	Bryant Hdwe. Co., Cleveland, Tenn.	10.27	3.15	11.46	55.18	12.00	2.50	12.00	46.00
765 Wynn	75	Gilt Edge Feed ...	Cleveland Milling Co., Cleveland, Tenn.	Rymer Bros., Cleveland, Tenn.	15.01	3.98	6.85	59.03	14.50	4.50	7.77	54.27
759 White	107	Horse Feed	McLemore, Crutcher & Co., Nashville, Tenn..	McLemore, Crutcher & Co., Nashville, Tenn..	13.16	3.82	5.11	63.65	12.30	4.67	14.69	53.30
756 White	104	Cooked Cow Feed.	American Steam Feed Co., Nashville, Tenn..	American Steam Feed Co., Nashville, Tenn..	25.89	5.10	11.00	43.06	26.00	7.50	10.00	44.00
754 White	102	Cooked Horse Feed	American Steam Feed Co., Nashville, Tenn..	American Steam Feed Co., Nashville, Tenn..	13.95	5.92	8.89	59.17	11.50	5.48	8.05	60.76
748 White	94	Perfection Horse Feed	Omaha Alfalfa Milling Co., Omaha, Nebr. ...	R. H. Worke & Co., Nashville, Tenn.	12.25	1.90	10.95	57.39	10.00	2.00	12.00	55.00

741	White	87	Cremo Brand Feed Meal	Tennessee Fibre Co., Memphis, Tenn.	24.31	4.83	21.78	35.33	20.00	5.00	22.00	38.00
735	Wynn	68	Dried Beet Pulp	Larowe Milling Co., Detroit, Mich.	9.13	.91	20.27	57.59	8.00	.50	20.00	58.90
733	Wynn	66	Dried Brewers' Grain	Chattanooga Brewing Co., Chattanooga ...	26.85	6.55	13.79	42.41	15.18	4.15	21.85	43.09
730	Wynn	63	Red Feather	C. R. Baird & Co., Chattanooga, Tenn. ..	11.06	4.07	1.74	71.32	9.59	4.03	2.77	70.56
726	Wynn	59	Blue Ribbon	Dan C. Wheeler & Co., Chattanooga, Tenn. ..	10.35	3.60	1.50	73.35	10.00	2.65	1.70	71.39
725	Wynn	58	Cyclone	American Cotton Hull & Fibre Co., Memphis..	21.24	4.27	23.40	39.59	20.00	3.00	23.00	40.00
721	Wynn	54	Steinmesch Mixed Feed	Steinmesch Feed Co., St. Louis, Mo.	12.46	4.69	4.10	64.26	10.00	3.50	6.00	65.00
716	Wynn	49	Harriman Mill Feed	Harriman Milling Co., Harriman, Tenn.	16.32	4.91	6.35	59.63	14.00	4.00	7.00	55.50
715	Wynn	48	Snowflake Mixed Feed	Lawrenceburg Roller M. Co., Lawrenceburg, Ind.	16.06	4.65	7.00	58.64	15.20	4.30	8.00	55.00
713	Wynn	46	Dayton Feed	Dayton Milling Co., Dayton, Tenn.	15.36	5.45	4.05	63.09	14.04	4.98	6.70	55.50
712	Wynn	45	Woolcott Mixed Feed	Woolcott Flour Mills, Lexington, Ky.	14.92	4.16	6.07	61.10	15.75	3.85	6.75	55.50
711	Wynn	44	Fine Feed or Feed Meal	Mountain City Milling Co., Chattanooga ...	14.22	5.03	4.73	63.40	12.50	5.50	8.50	60.00
709	Wynn	42	Mixed Feed	Newport Milling Co., Newport, Tenn.	15.27	4.75	5.53	60.90	13.50	4.00	8.00	63.00
701	Wynn	34	Mixed Feed	Whitesburg Milling Co., Whitesburg, Tenn. ..	15.53	4.77	7.72	58.47	15.00	5.00	6.00	59.00
700	Wynn	33	Acme Feed	Acme Milling Co., Talbott, Tenn.	14.92	3.97	5.35	61.78	12.94	5.07	7.39	59.21
699	Wynn	32	Mixed Feed	Cattlettsburg Mfg. Co., Cattlettsburg, Tenn..	15.62	4.39	3.80	53.36	16.94	4.61	6.42	56.63

MIXED FEED—Continued.

Chemist's Number	INSPECTOR	Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS							
						FOUND			GUARANTEED				
						Protein	Fat	Fibre	Carbo-hydrates	Protein	Fat	Fibre	Carbo-hydrates
691 Stout	65	Optime Feed	Pease & Dwyer Co., Memphis, Tenn.	Pease & Dwyer Co., Memphis, Tenn.	13.69	5.03	5.30	62.04	12.00	4.00	7.00	55.00
688 Stout	62	Rice Bran	Carlisle Rice Mill Co., Carlisle, Ark.	Pease & Dwyer Co., Memphis, Tenn.	13.78	13.72	9.67	43.11	14.00	12.00	11.00	43.00
685 Stout	59	Purity Feed	John Wade & Sons, Memphis, Tenn.	W. D. Moon & Co., Memphis, Tenn.	10.53	4.65	4.81	67.85	9.25	4.25	5.50	65.00
683 Stout	57	Jones' Cow Feed ..	Jones & Rogers, Memphis, Tenn.	Jones & Rogers, Memphis, Tenn.	20.62	6.05	10.53	49.47	17.00	5.00	16.00	50.00
680 Stout	54	Premium XXXX Stock Food	Cairo Milling Co., Cairo, Ill.	Bradford Milling Co., Bradford, Tenn.	10.62	3.43	15.44	55.33	11.00	3.50	15.00	60.00
679 Stout	53	Mixed Feed	Standard Milling Co., Clinton, Ky.	Bradford Milling Co., Bradford, Tenn.	15.01	5.29	8.15	56.09	13.75	4.25	12.00	.....
674 Stout	48	Ceralfa Stock Feed.	Edgar Morgan Co., Memphis, Tenn.	Edgar Morgan Co., Memphis, Tenn.	12.99	3.65	9.25	59.29	13.00	3.50	11.50	55.00
670 Stout	44	Croesus Feed	Jones & Rogers, Memphis, Tenn.	Jones & Rogers, Memphis, Tenn.	16.50	4.98	8.20	56.98	14.00	5.00	9.00	60.00
665 Stout	39	Premium Alfalfa Mixed Feed	Trenholm Kolp Co., Memphis, Tenn.	Trenholm Kolp Co., Memphis, Tenn.	12.72	3.38	9.85	60.48	10.00	3.50	12.00	50.00
661 Stout	35	Cotton Seed Feed Meal, Imperial ..	Memphis Mfg. Co., Memphis, Tenn.	Memphis Mfg. Co., Memphis, Tenn.	18.43	3.97	25.64	39.15	22.00	.05	22.00	38.00
658 Stout	32	More Milk Dairy Feed	Randolph Groc. Whse. Co., Memphis, Tenn...	Randolph Groc. Whse. Co., Memphis, Tenn..	15.53	4.78	10.90	57.09	16.00	5.00	13.00	60.00
657 Stout	31	Cremo Brand Feed Meal	Tennessee Fibre Co., Memphis, Tenn.	Randolph Groc. Whse. Co., Memphis, Tenn..	24.39	4.80	21.35	36.71	20.00	5.00	22.00	38.00

644	White	.....	80	Mixed Feed	.....	Maury Milling Co., Mt. Pleasant, Tenn..	13.51	3.93	8.07	60.14	9.97	4.70	4.46	59.16
640	White	.....	76	Standard Feed	.....	Ashton Mills, Columbia, Tenn.	12.20	5.15	7.40	61.32	12.68	5.37	7.71	58.57
633	White	.....		Special Mixed Feed	.....	West End Mill, Columbia, Tenn.	12.72	3.48	14.00	57.47	.....	.....	.....	.....
632	White	.....		Special Mixed Feed	.....	West End Mill, Columbia, Tenn.	9.65	3.72	4.72	70.02	.....	.....	.....	.....
627	Stout	.....	20	Cow Feed	.....	Trenton Milling Co., Trenton, Ky.	14.65	4.70	7.50	59.40	13.91	4.77	8.50	59.14
625	Stout	.....	18	Gayosa Brand	.....	Gayosa Oil Works, Memphis, Tenn.	42.65	7.80	6.47	29.65	41.00	8.00	10.00	33.00
609	Stout	.....	2	Mixed Feed	.....	Browder Milling Co., Fulton, Ky.	15.36	3.78	7.05	60.12	13.75	4.25	9.00	54.00
607	Wynn	.....	31	Banner Feed	.....	Walker Milling & Prod. Co., Sevierville, Tenn.	16.67	4.10	7.96	55.89	14.41	4.04	7.23	50.00
606	Wynn	.....	30	Excelsior Feed	.....	Sevierville Mills, Sevierville, Tenn. ...	16.58	3.99	7.50	56.80	16.25	3.95	6.45	59.55
605	Wynn	.....	29	Holston River's Best Feed	.....	J. W. McDonald & Sons, Rogersville, Tenn. ..	15.53	3.65	6.30	60.47	14.00	4.00	8.00	55.00
602	Wynn	.....	26	Eureka Feed	.....	Eureka Roller Mill, Telford, Tenn.	15.88	3.96	7.82	57.62	14.00	4.00	7.00	55.00
598	Wynn	.....	22	Snow Flake Feed	.....	Watauga Flour Mills, Elizabethton, Tenn. .	15.27	3.80	8.72	56.67	15.40	4.00	9.00	55.00
596	Wynn	.....	20	Cow Feed	.....	Inter. Sugar Feed Co., Memphis, Tenn.	17.02	2.46	11.18	48.10	16.50	3.50	12.00	52.50
594	Wynn	.....	18	Cremo Brand Feed Meal	.....	Tennessee Fibre Co., Memphis, Tenn.	23.69	5.25	22.07	36.10	20.00	5.00	22.00	38.00
591	Wynn	.....	15	Model Mill Feed	...	Model Mill Co., Johnson City, Tenn..	16.50	5.02	5.25	57.79	14.70	4.00	7.15	55.00
588	Wynn	.....	12	Bomer Feed	.....	Quaker Oats Co., Chicago, Ill.	11.14	3.90	7.73	64.36	10.00	4.00	9.00	62.00

MIXED FEED—Continued.

Inspector's Number	Inspector	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS							
					FOUND				GUARANTEED			
					Protein	Fat	Fibre	Carbo- hydrates	Protein	Fat	Fibre	Carbo- hydrates
585 Wynn	9 Mixed Feed	Austed & Burk Co., Springfield, Ohio	Tennessee Grocery Co., Bristol, Tenn.	14.74	4.75	7.90	57.37	14.50	3.50	7.00	.....
584 Wynn	8 Mixed Feed	Twin City Mill Co., Bristol, Tenn.	Tennessee Grocery Co., Bristol, Tenn.	16.15	4.45	5.53	58.63	14.56	4.46	6.25	60.00
583 Wynn	7 Beaver Creek Feed	Barrow & Scott Milling Co., Bristol, Tenn.	Barrow & Scott Milling Co., Bristol, Tenn.	15.62	3.70	7.56	58.02	14.58	4.44	6.30	60.00
580 White	69 Wheat and Corn Bran	Dorris Milling Co., Nashville, Tenn.	Acme Stock & Poultry Sup. Co., Nashville..	14.04	4.00	6.39	61.77	12.00	4.50	8.50	51.00
578 White	67 Acme Developing Food	Acme Stock & Poultry Sup. Co., Nashville..	Acme Stock & Poultry Sup. Co., Nashville..	15.36	3.20	1.83	63.84	13.50	5.40	1.75	65.35
577 White	66 Acme Cooked Cow Feed	Acme Stock & Poultry Sup. Co., Nashville..	Acme Stock & Poultry Sup. Co., Nashville..	17.29	4.50	11.29	53.11	17.85	4.10	9.30	50.46
576 White	65 Cotton Seed Meal..	American Cotton Hull & Fibre Co., Memphis..	Acme Stock & Poultry Sup. Co., Nashville..	23.52	4.33	22.95	37.62	20.00	3.00	23.00	40.00
570 White	61 Mixed Feed	Hisle's Roller Mill, Murfreesboro, Tenn..	Hisle's Roller Mill, Murfreesboro, Tenn..	14.48	4.13	5.95	59.62	13.51	4.62	7.76	52.00
551 White	43 Ajax Horse and Mule Feed	Just Milling & Feed Co., Nashville, Tenn.	Just Milling & Feed Co., Nashville, Tenn.	10.53	3.60	6.00	65.50	10.00	3.25	12.00	58.00
550 White	42 Allafat Horse and Mule Feed	Just Milling & Feed Co., Nashville, Tenn.	Just Milling & Feed Co., Nashville, Tenn.	11.85	3.58	10.84	60.13	10.00	3.75	10.50	56.00
546 White	38 Milko Cow Feed	Just Milling & Feed Co., Nashville, Tenn.	Just Milling & Feed Co., Nashville, Tenn.	19.83	4.23	11.00	51.90	17.50	3.50	10.00	58.00
534 White	27 Mixed Feed	Farmers' Milling Co., McEwen, Tenn.	Farmers' Milling Co., McEwen, Tenn.	15.27	3.34	3.30	64.10	15.50	4.25	6.00	56.50

333	White	.....	26	Mixed Feed	.....	McEwen Milling Co., McEwen, Tenn.	14.04	3.70	8.15	58.62	14.50	4.00	9.50	55.00
527	White	.....	20	Corn Feed	.....	Cedar City Mills, Lebanon, Tenn.	11.58	8.26	7.35	61.11	9.50	7.00	6.31	50.00
526	White	.....	19	Wheat and Corn Bran	.....	Universal Milling Co., Lebanon, Tenn.	15.18	4.17	8.71	56.31	12.90	4.82	8.10	.....
515	White	.....	9	Mixed Feed	.....	McEwen Milling Co., McEwen, Tenn.	15.18	3.10	8.71	57.30	14.50	4.00	9.50	55.00
509	White	.....	3	Standard Feed	.....	The Riverside Milling Co., Shelbyville, Tenn.	14.92	3.78	7.18	54.61	14.31	5.23	7.61	45.35
507	White	.....	1	Homcoline	.....	American Hominy Co., Indianapolis, Ind. ...	17.90	6.10	6.90	54.86	17.00	5.00	7.00	55.90
597	Wynn	.....	21	Monarch Feed	.....	Monarch Milling Co., Elizabethton, Tenn. .	13.95	3.53	6.31	61.52	15.40	4.00	9.00	55.00
728	Wynn	.....	61	Milk and Butter Ration	.....	Tenn. River Milling Co., Chattanooga, Tenn. .	10.35	2.55	19.18	58.76	17.99	3.65	14.40	52.04
767	Wynn	.....	77	Dairymen's Favor- ite	.....	Cleveland Coal & Feed Co., Cleveland, Tenn.	17.99	5.81	16.50	46.32	19.00	6.00	25.00	43.07
757	White	.....	105	Cow Feed	.....	McLemore, Crutcher & Co., Nashville, Tenn..	18.43	2.93	11.33	51.61	21.75	5.46	14.36	41.34
638	White	.....	74	Stock Food	.....	Ashton Mills, Columbia, Tenn.	7.46	3.10	10.40	69.13	8.50	3.50	6.60	68.03
779	Wynn	.....	89	Maple Mill Feed	...	Maple Grove R. Mills, Limestone, Tenn. ...	11.85	3.18	5.12	67.05	14.50	4.00	8.00	48.00
521	White	.....	15	Acme Dry Mash	...	Acme Stock & Poultry Sup. Co., Nashville...	18.43	3.02	13.35	46.43	20.06	6.61	8.50	45.50
535	White	.....	28	Corn Bran	.....	J. A. & O. L. Jones M. & E. Co., Nashville, Tenn.	11.58	7.93	9.75	58.96	11.00	10.00	6.50	58.50
586	Wynn	.....	10	Mixed Feed	.....	Sparger Mill Co., Bristol, Va.	14.39	5.92	8.35	57.05	14.92	4.54	5.70	60.00
717	Wynn	.....	50	That Good Feed	....	Jellico Grocery Co., Jellico, Tenn.	13.34	8.00	2.90	64.11	14.37	6.71	1.80	70.32

MIXED FEED—Continued.

Inspector's Number	INSPECTOR	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS									
					FOUND			GUARANTEED						
					Protein	Fat	Fibre	Carbo-hydrates	Protein	Fat	Fibre	Carbo-hydrates		
747	White	.....	.....	Cooked Cow Feed	Morehead & Young, Nashville, Tenn.	Morehead & Young, Nashville, Tenn.	23.43	5.90	9.47	48.45	26.00	7.50	7.00	44.00
749	White	.....	.....	Eureka Cow Feed..	R. H. Worke & Co., Nashville, Tenn.	R. H. Worke & Co., Nashville, Tenn.	19.57	5.12	10.50	50.02	24.25	5.86	8.12	.....
802	Wynn	.....	.....	Little River Mill Feed	Hitch & Peery, Walland, Tenn.	Hitch & Peery Co., Maryville, Tenn.	13.95	4.38	6.40	61.45	16.94	4.27	6.59	57.71
806	Wynn	.....	.....	Mixed Feed	J. H. Douglass, Henry's X Roads ...	D. A. Northern, Jefferson City, Tenn. .	13.73	3.86	5.19	62.51	13.89	4.22	6.25	59.67
654	Stout	.....	.....	Dan Patch Special Feed	Inter. Sugar Feed Co. No. 2, Memphis, Tenn.	Inter. Sugar Feed Co. No. 2, Memphis, Tenn.	8.80	2.59	11.14	54.78	10.00	3.00	12.50	61.00
651	Stout	.....	.....	Inter. Happy Jack Mule Feed	Inter. Sugar Feed Co. No. 2, Memphis, Tenn.	Inter. Sugar Feed Co. No. 2, Memphis, Tenn.	8.95	2.65	19.45	55.97	10.00	3.20	12.00	70.00
615	Stout	.....	.....	Acme Feed	Valley Milling Co., St. Louis, Mo.	J. C. Felsenthal & Co., Humboldt, Tenn.	10.71	2.75	1.53	73.78	10.00	3.00	10.00	70.00
827	White	.....	.....	Hominy Feed	American Hominy Co., Indianapolis, Ind.	American Steam Feed Co., Nashville, Tenn.	12.90	11.15	3.00	62.32	.....	.....	.....	.....
823	Stout	.....	.....	Danco Feed	Dahnke-Walker Milling Co., Union City, Tenn.	Dahnke-Walker Milling Co., Union City, Tenn.	12.72	6.68	3.45	64.74	9.00	8.50	4.00	65.00
815	Wynn	.....	.....	Tip Top Feed	Madisonville Flouring Mills, Madisonville ..	Madisonville Flouring Mills, Madisonville .	15.27	4.25	6.28	60.27	14.60	4.20	7.60	53.40
814	Wynn	.....	.....	Acme Feed	Acme Evans Co., Indianapolis, Ind. ...	Lowery & Calfee, Madisonville, Tenn. .	18.08	4.90	6.93	56.41	16.50	4.00	9.00	54.00
813	Wynn	.....	.....	Holstein Feed	Indiana Milling Co., Terre Haute, Ind.	Lowery & Calfee, Madisonville, Tenn. .	12.02	3.62	18.55	52.55	12.00	3.00	14.00	.....

812	Wynn	.....	122	Jersey Dairy Feed.	Englewood Milling Co., Englewood, Tenn. ...	14.83	3.95	3.60	65.52	15.50	4.00	8.00	55.00
810	Wynn	.....	120	LaFollette Feed ...	W. M. Ausmus Co., LaFollette, Tenn. ...	16.50	4.77	5.44	59.83	14.57	4.18	6.51	55.00
809	Wynn	.....	119	Nonesuch	Louisville Cereal Mill Co., Louisville, Ky...	14.04	8.32	4.30	58.61	11.62	7.80	6.50	60.00
807	Wynn	.....	117	Whellock's Mills Feed	R. M. Kite, Dandridge, Tenn. ...	16.32	4.75	6.40	57.68	15.00	4.00	8.00	55.00
805	Wynn	.....	115	Mitchell Mill Feed.	W. C. Hill, Dandridge, Tenn. ...	15.80	4.13	5.38	61.50	15.00	4.00	8.00	55.00
799	Wynn	.....	109	Oswegon Feed	Peters & Bradley Mill Co., Knoxville, Tenn.	15.36	4.40	4.83	61.70	14.00	4.00	6.50	60.00
798	Wynn	.....	108	Mixed Feed	Lenoir City Mills, Lenoir City, Tenn....	16.76	4.16	6.27	57.93	14.50	4.50	8.00	55.00
795	Wynn	.....	105	Scott's Dairy Feed.	Scott's Mill Co., Knoxville, Tenn.	13.43	7.32	7.28	57.79	14.00	4.00	9.00	50.00
790	Wynn	.....	100	Cotton Seed Meal & Jasco Feed	J. Allen Smith & Co., Knoxville, Tenn.	18.16	4.65	6.09	57.17	19.00	4.00	9.00	50.00

MOLASSES OR SUGAR FEED.

Chemical's Number	INSPECTOR	Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS							
						FOUND			GUARANTEED				
						Protein	Fat	Fibre	Carbo-hydrates	Protein	Fat	Fibre	Carbo-hydrates
549 White	41	Milko Syrup Cow Feed	Just Milling & Feed Co., Nashville, Tenn.	Just Milling & Feed Co., Nashville, Tenn.	16.61	3.17	7.65	54.90	17.50	3.50	10.00	58.00
783 Wynn	93	Tuxedo Chop	Early & Daniel Co., Cincinnati, Ohio	Hackney Feed Co., Knoxville, Tenn.	13.49	3.56	9.05	58.60	12.50	4.00	10.00	60.00
786 Wynn	96	Alneeda Horse and Mule Feed	Alneeda Mills Co., St. Louis, Mo.	Hackney Feed Co., Knoxville, Tenn.	11.15	2.20	11.96	55.03	9.00	3.00	12.00	55.00
793 Wynn	103	Kolteat Dairy Feed	G. E. Patteson, Memphis, Tenn.	Davis & Susong, Knoxville, Tenn.	16.78	4.17	10.89	50.94	15.00	3.00	12.00	59.00
796 Wynn	106	Allafat Horse and Mule Feed	Just Milling & Feed Co., Knoxville, Tenn. ...	Lewis & Adcock, Knoxville, Tenn. ...	11.14	3.48	10.22	60.82	10.00	3.75	10.50	56.00
800 Wynn	110	Crown Horse Feed..	G. E. Patteson & Co., Memphis, Tenn.	Hitch & Peery Co., Maryville, Tenn.	10.38	2.19	12.38	58.19	9.00	2.00	12.00	59.00
659 Stout	33	King Corn Sugar Feed	M. C. Peters Mill Co., Omaha, Nebr.	Randolph Gro. Whse. Co., Memphis, Tenn...	11.35	2.01	10.00	54.44	9.00	1.50	18.00	50.00
752 White	98	Purina Dairy Feed	Ralston Purina Co., St. Louis, Mo.	R. H. Worke & Co., Nashville, Tenn.	18.40	2.92	19.47	45.38	16.50	3.00	15.00	45.00
587 Wynn	11	Purina Dairy Feed.	Ralston Purina Co., St. Louis, Mo.	W. J. Boston & Co., Johnson City, Tenn..	17.69	3.15	19.31	42.09	16.50	3.00	15.00	45.00
784 Wynn	94	Ce-Re-A-Lia Dairy Feed	Early & Daniel Co., Cincinnati, Ohio	Hackney Feed Co., Knoxville, Tenn.	15.94	2.81	5.69	57.58	18.00	4.50	8.00	60.00
706 Wynn	39	Sucrene Alfalfa Horse & Mule Feed	American Milling Co., Owensboro, Ky.	W. Van Huss & Son, Morristown, Tenn. ..	9.67	2.45	10.81	59.67	11.00	2.50	12.00	50.00
736 Wynn	69	Excello Horse Feed.	Excello Feed Milling Co., St. Joseph, Mo. ...	Chattanooga Feed Co., Chattanooga, Tenn. ..	10.62	2.66	9.45	61.73	11.41	4.10	15.00	58.41

520	White	.....	14	Kay Molasses Feed	Kornfalfa Feed Milling Co., Kansas City, Mo.	Acme Stock & Poultry Sup. Co., Nashville...	12.11	2.00	12.44	53.47	8.00	1.50	17.00	50.00
545	White	.....	37	Just Horse and Mule Feed	Just Milling & Feed Co., Nashville, Tenn.	Just Milling & Feed Co., Nashville, Tenn.	11.71	3.34	7.51	60.92	10.00	3.25	12.00	58.00
589	Wynn	.....	13	Purina Molasses Feed	Ralston Purina Co., St. Louis, Mo.	W. J. Boston & Co., Johnson City, Tenn..	11.47	3.26	8.89	60.98	9.00	1.50	12.00	59.06
622	Stout	.....	15	Purina Molasses Feed	Ralston Purina Co., St. Louis, Mo.	Dupree Bros., Brownsville, Tenn. ..	10.53	2.72	8.82	61.04	9.00	1.50	12.00	59.00
626	Stout	.....	19	Syrup Ration Horse Feed	Jno. Wade & Sons, Memphis, Tenn.	Sternberger & Felsen-thall, Brownsville ..	9.87	2.58	10.48	60.25	10.00	2.00	14.00	55.00
628	Stout	.....	21	Kay Molasses Feed	Kornfalfa Feed Milling Co., Kansas City, Mo.	Hicks & Lawrence, Jackson, Tenn.	10.98	.92	12.85	47.31	8.00	1.50	17.00	50.00
629	Stout	.....	22	Kornfalfa Feed	Kornfalfa Feed Milling Co., Kansas City, Mo.	Hicks & Lawrence, Jackson, Tenn.	11.23	3.18	14.09	59.31	11.00	3.50	12.00	60.00
631	Stout	.....	24	Kornfalfa Kandy Feed	Kornfalfa Feed Milling Co., Kansas City, Mo.	Hicks & Lawrence, Jackson, Tenn.	10.09	2.42	8.86	63.15	9.00	2.50	12.00	55.00
652	Stout	.....	26	Horse and Mule Feed	Inter. Sugar Feed Co. No. 2, Memphis, Tenn.	Inter. Sugar Feed Co. No. 2, Memphis, Tenn.	13.28	3.14	10.53	52.12	12.50	3.50	12.00	50.00
653	Stout	.....	27	Inter. Jewel Brand	Inter. Sugar Feed Co. No. 2, Memphis, Tenn.	Inter. Sugar Feed Co. No. 2, Memphis, Tenn.	8.66	2.20	12.51	55.16	9.00	2.00	12.50	65.00
660	Stout	.....	34	Peter's Arab Horse Feed	M. C. Peters Mill Co., Omaha, Nebr.	Randolph Groc. Whse. Co., Memphis, Tenn..	11.12	2.27	10.01	55.88	9.00	2.00	15.00	59.06
666	Stout	.....	40	"Eq-ui-no"	Memphis Milling Co., Memphis, Tenn.	J. E. Tate & Co., Memphis, Tenn.	11.38	1.89	14.06	51.59	9.00	2.00	14.00	52.00
688	Stout	.....	42	Old Beck Sweet Feed	Edgar Morgan Co., Memphis, Tenn.	Edgar Morgan Co., Memphis, Tenn.	10.61	2.56	8.11	59.26	8.50	2.00	12.00	55.00
669	Stout	.....	43	Gem Sweet Dalry Feed	Edgar Morgan Co., Memphis, Tenn.	Edgar Morgan Co., Memphis, Tenn.	16.00	2.95	10.73	48.14	16.00	2.00	15.00	45.00
684	Stout	.....	58	Superior Cow Feed	The Superior Feed Co., Memphis, Tenn.	W. D. Moon & Co., Memphis, Tenn.	9.00	1.58	13.40	52.41	8.00	1.50	18.00	50.00
686	Stout	.....	60	Moon Sugar Feed	W. D. Moon & Co., Memphis, Tenn.	W. D. Moon & Co., Memphis, Tenn.	13.31	2.82	8.47	52.90	11.65	3.00	11.04	64.00

MOLASSES OR SUGAR FEED—Continued.

Chemist's Number	INSPECTOR	Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS					
						FOUND			GUARANTEED		
						Protein	Fat	Fibre	Carbo-hydrates	Protein	Fat
687 Stout		61	Lasskorn Stock Feed	G. E. Patteson & Co., Memphis, Tenn.	W. D. Moon & Co., Memphis, Tenn.	10.58	1.65	10.05	54.07	10.00	2.50
690 Stout		64	Premo Mixed Feed.	Pease & Dwyer Co., Memphis, Tenn.	Pease & Dwyer Co., Memphis, Tenn.	9.54	2.71	8.68	61.59	10.00	2.00
695 Stout		69	Krak-A-Jak Horse Feed	The Superior Feed Co., Memphis, Tenn.	American Grain Co., Memphis, Tenn.	9.72	2.46	11.10	56.38	10.00	2.50
697 Stout		71	Apex Horse and Mule Feed	G. E. Patteson & Co., Memphis, Tenn.	Clarke, Burkle & Co., Memphis, Tenn.	11.33	2.22	11.91	53.18	10.00	2.00
731 Wynn		64	Arab	M. C. Peters Milling Co., Omaha, Nebr.	Stegall Feed Co., Chattanooga, Tenn. .	11.46	2.67	10.11	60.50	9.00	2.00
751 White		97	Jim Dandy Molasses Feed	Cairo Milling Co., Cairo, Ill.	Morehead & Young, Nashville, Tenn.	9.91	2.50	11.48	59.56	10.50	2.50
768 Wynn		78	Our Best	Cleveland Coal & Feed Co., Cleveland, Tenn.	Ryder Bros., Tenn.	10.00	2.78	7.11	64.94	9.00	2.00
780 Wynn		90	My Preference Horse & Mule Feed.	Shelton Grain & Feed Co., Chattanooga ...	Shelton Grain & Feed Co., Chattanooga ...	10.36	2.71	12.21	58.97	11.00	2.50

Inspector's Number	Inspector	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS							
					FOUND			GUARANTEED				
					Protein	Fat	Fibre	Carbo- hydrates	Protein	Fat	Fibre	Carbo- hydrates
766 Wynn	76 Rymer Bros. Chick- en Feed	Rymer Bros., Cleveland, Tenn.	Rymer Bros., Cleveland, Tenn.	11.23	3.06	2.30	71.05	9.00	2.50	5.00	57.00
758 White	106 Chicken Feed	McLemore, Crutcher & Co., Nashville, Tenn. .	McLemore, Crutcher & Co., Nashville, Tenn. .	11.14	3.28	2.06	70.96	11.40	4.70	3.60	68.30
753 White	101 Nutro Hen Feed ...	National Oats Co., St. Louis, Mo.	Hermitage Feed Co., Nashville, Tenn.	11.93	4.29	3.40	69.79	10.00	3.50	5.00	68.00
743 White	89 Dixie Chicken Feed	Morehead & Young, Nashville, Tenn.	Morehead & Young, Nashville, Tenn.	12.29	4.90	3.02	69.17	10.67	3.83	3.68	59.49
722 Wynn	55 Aunt Patsy's Poul- try Feed	Aunt Patsy's Poultry Feed Co., Memphis ..	Dan C. Wheeler & Co., Chattanooga, Tenn. .	16.67	4.73	7.82	56.63	16.83	4.50	7.28	54.22
707 Wynn	40 White Cross Scratch Feed	Albert Dickinson Co., Chicago, Ill.	W. Van Huss & Son, Morristown, Tenn. .	12.46	3.15	2.09	70.31	10.00	2.50	5.00	60.00
704 Wynn	37 Special Scratch Feed	Just Milling & Feed Co., Nashville, Tenn.	Neill & Isenberg, Morristown, Tenn.	10.27	4.12	1.90	71.88	10.00	3.00	4.00	62.00
698 Stout	72 Superior Laying Feed	The Superior Feed Co., Memphis, Tenn.	American Grain Co., Memphis, Tenn.	10.97	3.37	2.20	71.58	10.00	3.25	4.50	63.00
686 Stout	70 National Hen Feed .	Clarke, Burkle & Co., Memphis, Tenn.	Clarke, Burkle & Co., Memphis, Tenn.	11.58	3.60	2.15	70.82	10.50	4.00	65.00
682 Stout	66 Blue Hen Scratch Feed	Rapier Sugar Feed Co., Owensboro, Ky.	L. A. Thornton & Co., Memphis, Tenn.	11.32	3.12	3.05	63.51	10.00	3.00	5.00	65.00
689 Stout	63 Promo Mixed Hen Feed	Pease & Dwyer Co., Memphis, Tenn.	Pease & Dwyer Co., Memphis, Tenn.	11.41	3.34	2.56	70.48	10.00	3.50	5.00	60.00
673 Stout	47 Manna Rice Special Chick Feed	Edgar Morgan Co., Memphis, Tenn.	Edgar Morgan Co., Memphis, Tenn.	13.43	2.82	4.00	66.59	11.00	2.50	4.00	65.00

Inspector's Number	INSPECTOR	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS							
					FOUND				GUARANTEED			
					Protein	Fat	Fibre	Carbo- hydrates	Protein	Fat	Fibre	Carbo- hydrates
766 Wynn	76 Rymer Bros. Chick- en Feed	Rymer Bros., Cleveland, Tenn.	Rymer Bros., Cleveland, Tenn.	11.23	3.06	2.30	71.05	9.00	2.50	5.00	57.00
758 White	106 Chicken Feed	McLemore, Crutcher & Co., Nashville, Tenn. .	McLemore, Crutcher & Co., Nashville, Tenn. .	11.14	3.28	2.06	70.96	11.40	4.70	3.60	68.30
753 White	101 Nutro Hen Feed ...	National Oats Co., St. Louis, Mo.	Hermitage Feed Co., Nashville, Tenn.	11.93	4.29	3.40	69.79	10.00	3.50	5.00	68.00
743 White	89 Dixie Chicken Feed	Morehead & Young, Nashville, Tenn.	Morehead & Young, Nashville, Tenn.	12.29	4.90	3.02	69.17	10.67	3.83	3.68	59.49
722 Wynn	55 Aunt Patsy's Poul- try Feed	Aunt Patsy's Poultry Feed Co., Memphis ..	Dan C. Wheeler & Co., Chattanooga, Tenn. .	16.67	4.73	7.82	56.63	16.83	4.50	7.28	54.22
707 Wynn	40 White Cross Scratch Feed	Albert Dickinson Co., Chicago, Ill.	W. Van Huss & Son, Morristown, Tenn. ..	12.46	3.15	2.09	70.31	10.00	2.50	5.00	60.00
704 Wynn	37 Special Scratch Feed	Just Milling & Feed Co., Nashville, Tenn.	Neill & Isenberg, Morristown, Tenn.	10.27	4.12	1.90	71.88	10.00	3.00	4.00	62.00
698 Stout	72 Superior Laying Feed	The Superior Feed Co., Memphis, Tenn.	American Grain Co., Memphis, Tenn.	10.97	3.37	2.20	71.58	10.00	3.25	4.50	63.00
686 Stout	70 National Hen Feed .	Clarke, Burkle & Co., Memphis, Tenn.	Clarke, Burkle & Co., Memphis, Tenn.	11.58	3.60	2.15	70.82	10.50	4.00	65.00
682 Stout	66 Blue Hen Scratch Feed	Rapier Sugar Feed Co., Owensboro, Ky.	L. A. Thornton & Co., Memphis, Tenn.	11.32	3.12	3.05	63.51	10.00	3.00	5.00	65.00
689 Stout	63 Promo Mixed Hen Feed	Pease & Dwyer Co., Memphis, Tenn.	Pease & Dwyer Co., Memphis, Tenn.	11.41	3.34	2.56	70.48	10.00	3.50	5.00	60.00
673 Stout	47 Manna Rice Special Chick Feed	Edgar Morgan Co., Memphis, Tenn.	Edgar Morgan Co., Memphis, Tenn.	13.43	2.82	4.00	66.59	11.00	2.50	4.00	65.00

POULTRY FEED—Continued.

Chemist's Number	INSPECTOR	Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS							
						FOUND				GUARANTEED			
						Protein	Fat	Fibre	Carbo- hydrates	Protein	Fat	Fibre	Carbo- hydrates
672 Stout	46	Manna Hen Feed...	Edgar Morgan Co., Memphis, Tenn.	Edgar Morgan Co., Memphis, Tenn.	10.35	3.96	2.88	70.37	10.00	3.50	5.00	60.08
671 Stout	45	Gem Scratch Feed...	Edgar Morgan Co., Memphis, Tenn.	Edgar Morgan Co., Memphis, Tenn.	10.53	4.05	2.65	69.91	10.00	3.50	4.00	65.00
668 Stout	37	Premium Hen Feed.	Trenholm Kolp Co., Memphis, Tenn.	Trenholm Kolp Co., Memphis, Tenn.	11.93	4.07	4.40	67.37	10.00	3.50	5.00	60.00
656 Stout	30	Poultry Feed, Scratch Size	Inter. Sugar Feed Co., No. 2, Memphis, Tenn.	Inter. Sugar Feed Co., No. 2, Memphis, Tenn.	11.06	4.05	2.69	70.48	10.00	3.50	5.00	70.39
655 Stout	29	Inter. Jewel Hen Feed	Inter. Sugar Feed Co., No. 2, Memphis, Tenn.	Inter. Sugar Feed Co., No. 2, Memphis, Tenn.	12.02	3.15	2.75	69.12	10.00	3.00	5.00	70.00
624 Stout	17	Sunny South Hen Feed	Jno. Wade & Sons, Memphis, Tenn.	Sternberger & Felsen- thall, Brownsville ..	11.58	4.85	3.20	69.74	10.00	3.50	5.00	60.00
613 Stout	6	Corno Chick Feed...	Corno Mills Co., St. Louis, Mo.	J. C. Felsenthal & Co., Humboldt, Tenn.	10.18	2.62	2.20	73.96	10.75	2.75	3.00	68.00
610 Stout	3	Nutro Hen Feed....	National Oats Co., St. Louis, Mo.	J. C. Felsenthal & Co., Humboldt, Tenn.	11.06	4.28	2.25	70.92	10.00	3.50	5.00	68.00
590 Wynn	14	Chicken Feed	Good Luck Mills, St. Louis, Mo.	W. J. Boston & Co., Johnson City, Tenn. .	11.41	4.35	2.07	70.65	10.00	3.00	6.00	60.00
581 White	70	Acme Scratch Feed	Acme Stock & Poultry Sup. Co., Nashville ..	Acme Stock & Poultry Sup. Co., Nashville ..	11.23	3.55	2.60	70.41	9.94	6.42	2.02	63.34
579 White	68	Acme Pigeon Feed.	Acme Stock & Poultry Sup. Co., Nashville ..	Acme Stock & Poultry Sup. Co., Nashville ..	11.14	2.91	1.72	71.33	12.95	3.43	1.92	11.96
547 White	39	Eureka Scratch Feed	Just Milling & Feed Co., Nashville, Tenn.	Just Milling & Feed Co., Nashville, Tenn.	10.53	3.32	1.82	72.60	10.50	4.00	3.75	70.00

544	White	.....	36	Home Scratch Feed	Just Milling & Feed Co., Nashville, Tenn.	11.35	5.22	4.35	66.82	10.00	3.25	3.75	66.50
542	White	.....	34	Dixie Scratch Feed.	Just Milling & Feed Co., Nashville, Tenn.	9.39	3.51	2.41	60.39	9.00	3.00	4.00	62.00
541	White	.....	33	Special Scratch Feed	Just Milling & Feed Co., Nashville, Tenn.	11.23	3.75	2.15	70.27	10.00	3.00	4.00	62.00
540	White	.....	32	Eureka Baby Chick Feed	Just Milling & Feed Co., Nashville, Tenn.	11.67	4.09	2.44	67.04	11.00	3.50	4.00	66.00
525	White	.....	18	Chicken Feed	Dodson Grain Co., Lebanon, Tenn.	10.88	3.61	2.40	70.84	10.00	3.50	6.00	60.00
514	White	.....	8	Chick Size	Purina Mills, St. Louis, Mo.	11.14	3.00	2.08	70.36	11.00	3.00	4.00	65.00
513	White	.....	7	Scratch Size	Purina Mills, St. Louis, Mo.	10.88	1.97	2.48	71.56	11.00	3.00	4.00	65.00
552	White	.....	44	Eureka Laying Mash Feed	Just Milling & Feed Co., Nashville, Tenn.	15.02	3.73	3.90	58.50	18.00	4.00	7.00	66.00
543	White	.....	35	Just Pigeon Feed..	Just Milling & Feed Co., Nashville, Tenn.	11.50	4.18	3.19	69.16	13.00	4.00	3.00	68.00
794	Wynn	.....	104	Imperial Crown Chicken Feed	Newport Milling Co., Loudon, Tenn.	10.97	3.12	1.82	71.93	10.00	4.00	3.00	64.75

COTTON SEED MEAL.

Chemist's Number	INSPECTOR	Inspector's Number	NAME OF FEEDSTUFF	NAME OF MANUFACTURER	MERCHANT OR SELLING AGENT	ANALYSIS							
						FOUND				GUARANTEED			
						Protein	Fat	Fibre	Carbo-hydrates	Protein	Fat	Fibre	Carbo-hydrates
791 Wynn		101	Buckeye Cotton Seed Meal	Buckeye Cotton Oil Co., Cincinnati, Ohio	McDaniel & Ault, Knoxville, Tenn.	38.00	6.56	11.90	31.10	38.62	6.00	12.00	.....
789 Wynn		99	Cherokee Brand Cotton Seed Meal	Rome Oil & Fert. Co., Rome, Ga.	Hackney Feed Co., Knoxville, Tenn.	39.22	7.32	11.76	23.05	38.62	6.00	10.00	22.00
787 Wynn		97	Durjon Brand Cotton Seed Meal	Union Brokerage & Corn Co., Vicksburg, Miss.	Hackney Feed Co., Knoxville, Tenn.	42.38	8.30	6.73	28.31	41.00	7.50	10.00	25.00
770 Wynn		80	High Grade Cotton Seed Meal	Summerville Cot. Oil Co., Summerville, Ga.	Bryant Hdwe. Co., Cleveland, Tenn.	44.15	7.65	6.10	28.44	41.00	7.00	8.00	25.00
761 Wynn		71	Cotton Seed Meal	Lookout Refining Co., Chattanooga, Tenn.	F. A. Hood & Co., Chattanooga, Tenn.	40.02	8.15	7.38	30.76	38.62	7.00	8.00	25.00
760 Wynn		70	Cotton Seed Meal	Lookout Refining Co., Chattanooga, Tenn.	F. A. Hood & Co., Chattanooga, Tenn.	41.86	7.47	8.43	28.96	41.00	7.00	8.00	25.00
755 White		103	Prime Cotton Seed Meal	The Buckeye Cotton Oil Co., Cincinnati, Ohio.	American Steam Feed Co., Nashville, Tenn.	38.17	5.93	13.65	30.08	38.62	6.00	12.00	.....
742 White		88	Cotton Seed Meal	Lanier Bros., Nashville, Tenn.	Morehead & Young, Nashville, Tenn.	38.61	7.84	7.92	33.99	38.62	6.00	10.00	22.00
738 White		99	High Grade Cotton Seed Meal	Farmers' Cot. Oil & E. Co., Huntsville, Ala.	T. E. Farris, Winchester, Tenn.	41.46	7.55	7.57	30.77	41.44	8.19	8.31	31.00
705 Wynn		38	Cotton Seed Meal	Richmond Cot. Oil Co., Chattanooga, Tenn.	Neill & Isenberg, Morristown, Tenn.	42.82	9.83	5.02	28.98	41.00	7.00	8.00	25.00
667 Stout		41	Prime Cotton Seed Meal	Tenn. Cotton Oil Co., Memphis, Tenn.	Tenn. Cotton Oil Co., Memphis, Tenn.	39.66	8.90	7.40	29.88	38.61	8.00	11.50	25.00
664 Stout		38	Prime Cotton Seed Meal	Buckeye Cot. Oil Co., Memphis, Tenn.	Trenholm Kolp Co., Memphis, Tenn.	37.91	7.13	10.87	31.34	38.62	6.00	12.00	.....

650	Garrison	Special Cotton Seed Meal	.....	A. J. Huggins, Jr., Kansas, Tenn.	40.98	6.40	10.60	28.41	41.00	7.00	8.00	26.00
630	Stout	23 Prime Cotton Seed Meal	.....	Madison Cotton Oil Co., Jackson, Tenn.	42.47	7.22	8.17	29.51	41.00	7.88	9.05	27.82
623	Stout	16 Cotton Seed Meal, Golden Yellow	..	Brownsville Cot. Oil & S. Co., Brownsville ..	41.68	7.70	7.10	30.65	41.00	6.00	10.00	.....
620	Stout	13 Prime Cotton Seed Meal	.....	Tenn. Cotton Oil Co., Jackson, Tenn.	42.12	8.55	8.15	28.34	38.61	8.00	11.50	25.00
618	Stout	11 Prime Cotton Seed Meal	.....	Buckeye Cotton Oil Co., Memphis, Tenn.	39.05	7.00	9.75	30.99	38.62	6.00	12.00	.....
600	Wynn	24 Standard Grade Cotton Seed Meal	..	Georgia Cotton Oil Co., Rome, Ga.	38.35	6.70	10.70	31.25	38.62	6.00	12.00	29.00
599	Wynn	23 Cotton Seed Meal	..	Elba Mfg. Co., Charlotte, N. C.	40.63	9.54	6.48	30.93	38.62	6.00	10.00	30.00
548	White	40 Cotton Seed Meal	..	Southern Cot. Oil Co., Decatur, Ala.	41.90	8.54	10.10	27.64	38.62	5.00	10.00	27.59
740	White	86 Cotton Seed Meal	..	Home Oil Mills, New Decatur, Ala. ..	37.38	5.95	14.67	30.68	38.62	5.00	10.00	27.50
801	White	111 Cotton Seed Meal	..	Calhoun Oil & Fert. Co., Calhoun, Ga.	38.61	6.70	11.05	32.87	41.00	6.60	9.50	24.00
838	White	31 Choice Cotton Seed Meal	.....	Imperial Cotto Milling Co., Memphis, Tenn. .	40.10	7.91	8.67	27.19	41.00	8.00	9.00	.....
785	Wynn	95 Imperial Cotto	....	Imperial Cotto Milling Co., Memphis, Tenn. .	37.21	6.79	10.66	31.29	38.62	7.00	12.00	.....
662	Stout	36 Choice Cotton Seed Meal	.....	Imperial Cotto Milling Co., Memphis, Tenn. .	42.47	9.73	6.10	28.41	41.00	8.00	9.00	.....
739	White	100 Prime Cotton Seed Meal	.....	F. W. Brode & Co., Memphis, Tenn.	36.86	5.81	14.57	29.71	38.63	6.00	10.00	22.00
634	White	Special Prime Cotton Seed Meal	..	F. W. Brode & Co., Memphis, Tenn.	37.12	5.53	15.53	29.45	38.63	6.00	10.00	22.00
592	Wynn	16 Special Cotton Seed Meal	..	Rome Oil & Fert. Co., Rome, Ga.	39.14	6.88	7.55	33.78	41.00	7.00	8.00	24.00
819	White	108 Cotton Seed Meal	..	Ascraft Cotton Mills, Florence, Ala.	36.86	8.76	13.75	29.34	38.62	8.00	12.00	25.00
777	Wynn	87 Standard Grade Cotton Seed Meal	....	Taylor Bros. & Co., Atlanta, Ga.	37.03	7.66	10.52	31.44	38.62	6.00	12.00	28.00

AVERAGE COMPOSITION OF AMERICAN FEEDING STUFFS.

For the information of those who are interested in the analysis of various feeds, I have taken the table from Henry's Feeds and Feeding, who in turn secured them mainly from Farmer's Bulletin 22, United States Department of Agriculture, which in turn is based on Jenkins and Winton's tables in Bulletin 11, Office of Experiment Stations, Department of Agriculture. The results not obtained from the above mentioned bulletins were secured by Henry from various experiment stations.

FEEDING STUFFS	PERCENTAGE COMPOSITION.					
	Water	Ash	Protein	Crude Fibre	Carbohydrates	Fat
Corn, Dent	10.6	1.5	10.3	2.2	70.4	5.0
Corn, flint	11.3	1.4	10.5	1.7	70.1	5.0
Corn, sweet	8.8	1.9	11.6	2.8	66.8	8.1
Corn meal	15.0	1.4	9.2	1.9	68.7	3.8
Corn cob	10.7	1.4	2.4	30.1	54.9	0.5
Corn and cob meal	15.1	1.5	8.5	6.6	64.8	3.5
Corn bran	9.1	1.3	9.0	12.7	62.2	5.8
Corn germ	10.7	4.0	9.8	4.1	64.0	7.4
Hominy chops	11.1	2.5	9.8	3.8	64.5	8.3
Germ meal	8.1	1.3	11.1	9.9	62.5	7.1
Dried starch and sugar feed	10.9	0.9	19.7	4.7	54.8	9.0
Starch feed, wet	65.4	0.3	6.1	3.1	22.0	3.1
Maize feed, Chicago	9.1	0.9	22.8	7.6	52.7	6.9
Grano-gluten	5.8	2.8	31.1	12.0	33.4	14.9
Cream, gluten	8.1	0.7	36.1	1.3	39.0	14.8
Gluten meal	8.2	0.9	29.3	3.3	46.5	11.8
Gluten feed	7.8	1.1	24.0	5.3	51.2	10.6
Wheat, all analyses	10.5	1.8	11.9	1.8	71.9	2.1
Wheat, spring	10.4	1.9	12.5	1.8	71.2	2.2
Wheat, winter	10.5	1.8	11.8	1.8	72.0	2.1
Flour, high grade	12.2	0.6	14.9	0.3	70.0	2.0
Flour, low grade	12.0	2.0	18.0	0.9	63.3	3.9
Flour, dark feeding	9.7	4.3	19.9	3.8	56.2	6.2
Flax seed	9.2	4.3	22.6	7.1	23.2	33.7
Flax seed, ground	8.1	4.7	21.6	7.3	27.9	30.4
Bran, all analyses	11.9	5.8	15.4	9.0	53.9	4.0
Bran, spring wheat	11.5	5.4	16.1	8.0	54.5	4.5
Bran, winter wheat	12.3	5.9	16.0	8.1	53.7	4.0
Middlings	12.1	3.3	15.6	4.6	60.4	4.0
Shorts	11.8	4.6	14.9	7.4	56.8	4.5
Wheat screenings	11.6	2.9	12.5	4.9	65.1	3.0
Rye	11.6	1.9	10.6	1.7	72.5	1.7
Rye flour	13.1	0.7	6.7	0.4	78.3	0.8
Rye bran	11.6	3.6	14.7	3.5	63.8	2.8
Rye shorts	9.3	5.9	18.0	5.1	59.9	2.8

AVERAGE COMPOSITION OF AMERICAN FEEDING-STUFFS—*Continued.*

FEEDING STUFFS	PER CENTAGE COMPOSITION.					
	Water	Ash	Protein	Crude Fibre	Carbohydrates	Fat
Barley	10.9	2.4	12.4	2.7	69.8	1.8
Barley meal	11.9	2.6	10.5	6.5	66.3	2.2
Barley screenings	12.2	3.6	12.3	7.3	61.8	2.8
Brewers' grains, wet	75.7	1.0	5.4	3.8	12.5	1.6
Brewers' grains, dried	8.2	3.6	19.9	11.0	51.7	5.6
Malt sprouts	10.2	5.7	23.2	10.7	48.5	1.7
Oats	11.0	3.0	11.8	9.5	59.7	5.0
Oat meal	7.9	2.0	14.7	0.9	67.4	7.1
Oat feed	7.7	3.7	16.0	6.1	59.4	7.1
Oat dust	6.5	6.9	13.5	18.2	50.2	4.8
Oat hulls	7.3	6.7	3.3	29.7	52.1	1.0
Rice	12.4	0.4	7.4	0.2	79.2	0.4
Rice meal	10.2	8.1	12.0	5.4	51.2	13.1
Rice hulls	8.2	13.2	3.6	35.7	38.6	0.7
Rice bran	9.7	10.0	12.1	9.5	49.9	8.8
Rice polish	10.0	6.7	11.7	6.3	58.0	7.3
Buckwheat	12.6	2.0	10.0	8.7	64.5	2.2
Buckwheat flour	14.6	1.0	6.8	0.3	75.8	1.4
Buckwheat hulls	13.2	2.2	4.6	43.5	35.3	1.1
Buckwheat bran	10.5	3.0	12.4	31.9	38.8	3.3
Buckwheat shorts	11.1	5.1	27.1	8.3	40.8	7.6
Buckwheat middlings	13.2	4.8	28.9	4.1	41.9	7.1
Sorghum seed	12.8	2.1	9.1	2.6	69.8	3.6
Broom-corn seed	11.5	3.4	10.2	7.1	63.6	3.0
Kaffir-corn seed	9.3	1.5	9.9	1.4	74.9	3.0
Millet seed	14.0	3.3	11.8	9.5	57.4	4.0
Hungarian grass seed	9.5	5.0	9.9	7.7	63.2	4.7
Linseed meal, old process	9.2	5.7	32.9	8.9	35.4	7.9
Linseed meal, new process	10.1	5.8	33.2	9.5	38.4	3.0
Cottonseed	10.3	3.5	18.4	28.2	24.7	19.9
Cottonseed, roasted	6.1	5.5	16.8	20.4	23.5	27.7
Cottonseed meal	8.2	7.2	42.3	5.6	23.6	13.1
Cottonseed hulls	11.1	2.8	4.2	46.3	33.4	2.2
Cottonseed kernels (without hulls) ..	6.2	4.7	31.2	3.7	17.6	36.6
Cocanut cake	10.3	5.9	19.7	14.4	38.7	11.0
Palm nut meal	10.4	4.3	16.8	24.0	35.0	9.5
Sunflower seed	8.6	2.6	16.3	29.9	21.4	21.2
Sunflower seed cake	10.5	6.7	32.8	13.5	27.1	9.1
Peanut kernel (without hulls)	7.5	2.4	27.9	7.0	15.6	39.6
Peanut meal	10.7	4.9	47.6	5.1	23.7	8.0
Rape and cake	10.0	7.9	31.2	11.3	30.0	9.6
Pea meal	10.5	2.6	20.2	14.4	51.1	1.2
Soja bean	10.8	4.7	34.0	4.8	28.8	16.9
Cow pea	14.8	3.2	20.8	4.1	55.7	1.4
Horse bean	11.3	3.8	26.6	7.2	50.1	1.0

AVERAGE COMPOSITION OF AMERICAN FEEDING-STUFFS—*Continued.*

FEEDING STUFFS	PERCENTAGE COMPOSITION.					
	Water	Ash	Protein	Crude Fibre	Carbohydrates	Fat
ROUGHAGE.						
Corn forage, field cured.						
Fodder corn	42.2	2.7	4.5	14.3	34.7	1.6
Corn stover	40.5	3.4	3.8	19.7	31.5	1.1
Corn husks	50.9	1.8	2.5	15.8	28.3	0.7
Corn leaves	30.0	5.5	6.0	21.4	35.7	1.4
Hay from grasses.						
Hay from mixed grasses	15.3	5.5	7.4	27.2	42.1	2.5
Timothy, all analyses	13.2	4.4	5.9	29.0	45.0	2.5
Timothy, cut in full bloom	15.0	4.5	6.0	29.6	41.9	3.0
Timothy, cut soon after bloom	14.2	4.4	5.7	28.1	44.6	3.0
Timothy, cut when nearly ripe	14.1	3.9	5.0	31.1	43.7	2.2
Orchard grass	9.9	6.0	8.1	32.4	41.0	2.6
Red top, cut at different stages	8.9	5.2	7.9	28.6	47.5	1.9
Red top, cut in bloom	8.7	4.9	8.0	29.9	46.4	2.1
Kentucky blue grass	21.2	6.3	7.8	23.0	37.8	3.9
Kentucky blue grass, cut when seed in milk	24.4	7.0	6.3	24.5	34.2	3.6
Kentucky blue grass, cut when seed ripe	27.8	6.4	5.8	23.8	33.2	3.0
Hungarian grass	7.7	6.0	7.5	27.7	49.0	2.1
Meadow fescue	20.0	6.8	7.0	25.9	38.4	2.7
Italian rye grass	8.5	6.9	7.5	30.5	45.0	1.7
Perennial rye grass	14.0	7.9	10.1	25.4	40.5	2.1
Rowen (mixed)	16.6	6.8	11.6	22.5	39.4	3.1
Mixed grasses and clovers	12.9	5.5	10.1	27.6	41.3	2.6
Barley hay, cut in milk	15.0	4.2	8.8	24.7	44.9	2.4
Oat hay, cut in milk	15.0	5.2	9.3	29.2	39.0	2.3
Swamp hay	11.6	6.7	7.2	26.6	45.9	2.0
Salt marsh hay	10.4	7.7	5.5	30.0	41.1	2.4
Wild oat grass	14.3	3.8	5.0	25.0	48.8	3.3
Buttercups	9.3	5.6	9.9	30.6	41.1	3.5
White daisy	10.3	6.6	7.7	30.0	42.0	3.4
Johnson grass	10.2	6.1	7.2	28.5	45.9	2.1
Hay from legumes						
Red clover	15.3	6.2	12.3	24.8	38.1	3.3
Red clover in bloom	20.8	6.6	12.4	21.9	33.8	4.5
Red clover, mammoth	21.2	6.1	10.7	24.5	33.6	3.9
Alsike clover	9.7	8.3	12.8	25.6	40.7	2.9
White clover	9.7	8.3	15.7	24.1	39.3	2.9
Crimson clover	9.6	8.6	15.2	27.2	36.6	2.8
Japan clover	11.0	8.5	13.8	24.0	39.0	3.7
Alfalfa	8.4	7.4	14.3	25.5	42.7	2.2
Cow pea	10.7	7.5	16.6	20.1	42.2	2.2

AVERAGE COMPOSITION OF AMERICAN FEEDING-STUFFS—*Continued.*

FEEDING STUFFS	PERCENTAGE COMPOSITION.					
	Water	Ash	Protein	Crude Fibre	Carbohydrates	Fat
Soja bean	11.3	7.2	15.4	22.3	38.6	5.2
Pea vine	15.0	6.7	13.7	24.7	37.6	2.3
Vetch	11.3	7.9	17.0	25.4	36.1	2.3
Serradella	9.2	7.2	15.2	21.6	44.2	2.6
Flat pea	8.4	7.9	22.9	26.2	31.4	3.2
Peanut vines (without nuts)	7.6	10.8	10.7	23.6	42.7	4.6
Sanfoin	15.0	7.3	14.8	20.4	39.5	3.3
Straw.						
Wheat	9.6	4.2	3.4	38.1	43.4	1.3
Rye	7.1	3.2	3.0	38.9	46.6	1.2
Oat	9.2	5.1	4.0	37.0	42.4	2.3
Barley	14.2	5.7	3.5	36.0	39.0	1.5
Wheat chaff	14.3	9.2	4.5	36.0	34.6	1.4
Oat chaff	14.3	10.0	4.0	34.0	36.2	1.5
Buckwheat straw	9.9	5.5	5.2	43.0	35.1	1.3
Soja bean	10.1	5.8	4.6	40.4	37.4	1.7
Horse bean	9.2	8.7	8.8	37.6	34.3	1.4
Silage.						
Corn	79.1	1.4	1.7	6.0	11.0	0.8
Sorghum	76.1	1.1	0.8	6.4	15.3	0.3
Red clover	2.0	2.6	4.2	8.4	11.6	1.2
Soja bean	74.2	2.8	4.1	9.7	6.9	2.2
Apple pomace	85.0	0.6	1.2	3.3	8.8	1.1
Cowpea vine	79.3	2.9	2.7	6.0	7.6	1.5
Cowpea and soja bean vines, mixed....	69.8	4.5	3.8	9.5	11.1	1.3
Field pea vine	50.1	3.5	5.9	13.0	26.0	1.6
Barnyard millet and soja bean	79.0	2.8	2.8	7.2	7.2	1.0
Corn and soja bean	76.0	2.4	2.5	7.2	11.1	0.8
Rye	80.8	1.6	2.4	5.8	9.2	0.3
Roots and Tubers.						
Potato	78.9	1.0	2.1	0.6	17.3	0.1
Beets, common	88.5	1.0	1.5	0.9	8.0	0.1
Beet, sugar	86.5	0.9	1.8	0.9	9.8	0.1
Beet, mangel	90.9	1.1	1.4	0.9	5.5	0.2
Turnip	90.5	0.8	1.1	1.2	6.2	0.2
Rutabaga	88.6	1.2	1.2	1.3	7.5	0.2
Carrott	88.6	1.0	1.1	1.3	7.6	0.4
Parsnip	88.3	0.7	1.6	1.0	10.2	0.2
Artichoke	79.5	1.0	2.6	0.8	15.9	0.2
Sweet potato	71.1	1.0	1.5	1.3	24.7	0.4
MISCELLANEOUS.						
Cabbage	90.5	1.4	2.4	1.5	3.9	0.4
Spurry	75.7	4.0	2.0	4.9	12.7	0.8
Sugar-beet leaves	88.0	2.4	2.6	2.2	4.4	0.4
Pumpkin (field)	90.9	0.5	1.3	1.7	5.2	0.4

AVERAGE COMPOSITION OF AMERICAN FEEDING-STUFFS—*Continued.*

FEEDING STUFFS	PERCENTAGE COMPOSITION.					
	Water	Ash	Protein	Crude Fibre	Carbohydrates	Fat
Pumpkin (garden)	80.8	0.9	1.8	1.8	7.9	0.8
Prickly comfrey	88.4	2.2	2.4	1.6	5.1	0.3
Rape	84.5	2.0	2.3	2.6	8.4	0.5
Acorns, fresh	55.3	1.0	2.5	4.4	34.8	1.9
Apples	80.8	0.4	0.7	1.2	16.6	0.4
Cow's Milk	87.2	0.7	3.6	.....	4.9	3.7
Cow's milk colostrum	74.6	1.6	17.6	.....	2.7	3.6
Mare's milk	91.0	0.4	2.1	.....	5.3	1.2
Ewe's milk	81.3	0.8	6.3	.....	4.7	6.8
Goat's milk	86.9	0.9	3.7	.....	4.4	4.1
Sow's milk	80.8	1.1	6.2	.....	4.8	7.1
Skim milk, gravity	90.4	0.7	3.3	.....	4.7	0.9
Skim milk, centrifugal	90.6	0.7	3.1	.....	5.3	0.3
Buttermilk	90.1	0.7	4.0	.....	4.0	1.1
Whey	93.8	0.4	0.6	.....	5.1	0.1
Dried blood	8.5	4.7	84.4	.....	.....	2.5
Meat scraps	10.7	4.1	71.2	.....	0.3	13.7
Dried fish	10.8	29.2	48.4	.....	.....	11.6
Beet pulp	89.8	0.6	0.9	2.4	6.3	.....
Beet molasses	20.8	10.6	9.1	.....	59.5	.....
Apple pomace	76.7	0.5	1.4	3.9	16.2	1.3
Sorghum bagasse	83.9	0.6	0.6	3.2	11.7*	.....
Distillery slops	93.7	0.2	1.9	0.6	2.8	0.9
Dried sediment from distillery slops...	5.0	11.3	27.4	8.0	36.1	12.3

*Includes fat.

AVERAGE DIGESTIBLE NUTRIMENTS AND FERTILIZING CONSTITUENTS IN AMERICAN FEEDING STUFFS.

The following table for the digestible nutrients and fertilizing constituents are taken from Henry's Feeds and Feeding, who in turn secured a number of the results from Bulletin 22, Office of Experiment Stations, United States Department of Agriculture, and various other sources.

NAME OF FEED	Dry Matter in 100 Pounds	Digestible Nutrients in 100 Lbs.			Fertilizing Constituents in 1,000 Lbs.		
		Protein	Fat	Carbohydrates	Nitrogen	Phosphoric Acid.	Potash
CONCENTRATES.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Corn, all analyses	89.1	7.9	4.3	66.7	18.2	7.0	4.0
Dent corn	89.4	7.8	4.3	66.7	16.5	.....	.....
Flint corn	88.7	8.0	4.3	66.2	16.8	.....	.....
Sweet corn	91.2	8.8	7.0	63.7	18.6	.....	.....
Corn cob	89.3	0.4	0.3	52.5	5.0	.6	6.0
Corn and cob meal	84.9	4.4	2.9	60.0	14.1	5.7	4.7
Corn bran	90.9	7.4	4.6	59.8	16.3	12.1	6.8
Gluten meal	91.8	25.8	11.0	43.3	50.3	3.3	0.5
Germ meal	89.6	9.0	6.2	61.2	26.5	8.0	5.0
Starch refuse	91.8	11.4	6.5	58.4	22.4	7.0	5.2
Grano-gluten	94.3	26.7	12.4	38.8	49.8	5.1	1.5
Hominy chops	88.9	7.5	6.8	55.2	16.3	9.8	4.9
Glucose meal	91.9	30.3	14.5	35.3	57.7	.....	.....
Sugar meal	93.2	18.7	8.7	51.7	36.3	4.1	0.3
Gluten feed	92.2	20.4	8.8	48.4	38.4	4.1	0.3
Wheat	89.5	10.2	1.7	69.2	23.6	7.9	5.0
High-grade flour	87.6	8.9	0.9	62.4	18.9	2.2	1.5
Low-grade flour	87.6	8.2	0.9	62.7	28.9	5.6	3.5
Dark feeding flour	90.3	13.5	2.0	61.3	31.8	21.4	10.9
Wheat bran	88.1	12.2	2.7	39.2	26.7	28.9	16.1
Wheat bran, spring wheat	88.5	12.9	3.4	40.1	.....	.....	.....
Wheat bran, winter wheat	87.7	12.3	2.6	37.1	.....	.....	.....
Wheat shorts	88.2	12.2	3.8	50.0	28.2	13.5	5.9
Wheat middlings	87.9	12.8	3.4	53.0	26.3	9.5	6.3
Wheat screenings	88.4	9.8	2.2	51.0	24.4	11.7	8.4
Rye	88.4	9.9	1.1	67.6	17.6	8.2	5.4
Rye bran	88.4	11.5	2.0	50.3	23.2	22.8	14.0
Rye shorts	90.7	11.9	1.6	45.1	18.4	12.6	8.1
Barley	89.1	8.7	1.6	65.6	15.1	7.9	4.8
Malt sprouts	89.8	18.6	1.7	37.1	35.5	14.3	16.3
Brewers' grains, wet	24.3	3.9	1.4	9.3	8.9	3.1	0.5
Brewers' grains, dried	91.8	15.7	5.1	36.3	36.2	10.3	0.9

TABLE II.—AVERAGE DIGESTIBLE NUTRIENTS AND FERTILIZING CONSTITUENTS IN AMERICAN FEEDING-STUFFS—*Continued.*

NAME OF FEED	Dry Matter in 100 Pounds	Digestible Nutrients in 100 Lbs.			Fertilizing Constituents in 1,000 Lbs.		
		Protein	Fat	Carbohy- drates	Nitrogen	Phosphoric Acid.	Potash
CONCENTRATES—Cont'd.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Oats	89.0	9.2	4.2	47.3	20.6	8.2	6.2
Oat meal	92.1	11.5	5.9	52.1	23.5	.....	.....
Oat feed or shorts	92.3	12.5	2.8	46.9	17.2	9.1	5.3
Oat dust	93.5	8.9	5.1	38.4	21.6	.....	.....
Oat hulls	90.6	1.3	0.6	40.1	5.2	2.4	5.2
Rice	87.6	4.8	0.3	72.2	10.8	1.8	0.9
Rice hulls	91.8	1.6	0.6	44.5	5.8	1.7	1.4
Rice bran	90.3	5.3	7.3	45.1	7.1	2.9	2.4
Rice polish	90.0	9.0	6.5	56.4	19.7	26.7	7.1
Buckwheat	87.4	7.7	1.8	49.2	14.4	4.4	2.1
Buckwheat hulls	86.8	2.1	0.6	27.9	4.9	0.7	5.2
Buckwheat bran	89.5	7.4	1.9	30.4	36.4	17.8	12.8
Buckwheat shorts	88.9	21.1	5.5	33.5	.....	.....	.....
Buckwheat middlings	87.3	22.0	5.4	33.4	42.8	21.9	11.4
Sorghum seed	87.2	7.0	3.1	52.1	14.8	8.1	4.2
Broom-corn seed	85.9	7.4	2.9	48.3	16.3	.....	.....
Kaffir corn	84.8	7.8	2.7	57.1	.....	.....	.....
Millet	86.0	8.9	3.2	45.0	20.4	8.5	3.6
Flax seed	90.8	20.6	29.0	17.1	36.1	13.9	10.3
Linseed meal, old process	90.8	29.3	7.0	32.7	54.3	16.6	13.7
Linseed meal, new process.....	89.9	28.2	2.8	40.1	57.8	18.3	13.9
Cottonseed	89.7	12.5	17.3	30.0	31.3	12.7	11.7
Cottonseed meal	91.8	37.2	12.2	16.9	67.9	28.8	8.7
Cottonseed hulls	88.9	0.3	1.7	33.1	6.9	2.5	10.2
Cocoanut meal	89.7	15.6	10.5	38.3	32.8	16.0	24.0
Palm-nut meal	89.6	16.0	9.0	52.6	26.9	11.0	5.0
Sunflower seed	92.5	12.1	26.0	20.8	22.8	12.2	5.6
Sunflower seed cakes	91.8	31.2	12.8	19.6	55.5	21.5	11.7
Peanut meal	89.3	42.9	6.9	22.8	75.6	13.1	15.0
Rape-seed meal	90.0	25.2	7.5	23.7	49.6	20.0	13.0
Peas	89.5	16.8	0.7	51.8	30.8	8.2	9.9
Soja (soy bean)	89.2	29.6	14.4	22.3	53.0	18.7	19.0
Cowpea	85.2	18.3	1.1	54.2	33.3	.....	.....
Horse bean	85.7	22.4	1.2	49.3	40.7	12.0	12.9
ROUGHAGE, Fodder Corn.							
Fodder corn, green	20.7	1.0	0.4	11.6	4.1	1.5	3.3
Fodder corn, field cured	57.8	2.5	1.2	34.6	17.6	5.4	8.9
Corn stover, field cured	59.5	1.7	0.7	32.4	10.4	2.9	14.0

TABLE II.—AVERAGE DIGESTIBLE NUTRIENTS AND FERTILIZING CONSTITUENTS IN AMERICAN FEEDING-STUFFS—*Continued.*

NAME OF FEED	Dry Matter in 100 Pounds	Digestible Nutrients in 100 Lbs.			Fertilizing Constituents in 100 Lbs.		
		Protein	Fat	Carbohydrates	Nitrogen	Phosphoric Acid.	Potash
Hay.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Timothy	86.8	2.8	1.4	43.4	12.6	5.3	9.0
Orchard grass	90.1	2.8	1.4	42.3	13.1	4.1	18.8
Redtop	91.1	4.8	1.0	46.9	11.5	3.6	10.2
Kentucky blue grass	78.8	4.8	2.0	37.3	11.9	4.0	15.7
Hungarian grass	92.3	4.5	1.3	51.7	12.0	3.5	13.0
Mixed grasses	87.1	5.9	1.2	40.9	14.1	2.7	15.5
Rowen (mixed)	83.4	7.9	1.5	40.1	16.1	4.3	14.9
Meadow fescue	80.0	4.2	1.7	43.3	9.9	4.0	21.0
Soja-bean hay	88.7	10.8	1.5	38.7	23.2	6.7	10.8
Oat hay	91.1	4.3	1.5	46.4	.....	.....	.....
Marsh or swamp hay	88.4	2.4	0.9	29.9	.....	.....	.....
White daisy	85.0	3.8	1.2	40.7	.....	.....	.....
Straw.							
Wheat	90.4	0.4	0.4	36.3	5.9	1.2	5.1
Rye	92.9	0.6	0.4	40.6	4.6	2.8	7.9
Oat	90.8	1.2	0.8	38.6	6.2	2.0	12.4
Barley	85.8	0.7	0.6	41.2	13.1	3.0	20.9
Wheat chaff	85.7	0.3	0.5	23.3	7.9	7.0	4.2
Oat chaff	85.7	1.5	0.7	33.0	.....	.....	.....
LEGUME.							
Hay and Straw.							
Red clover, medium	84.7	6.8	1.7	35.8	20.7	3.8	22.0
Red clover, mammoth	78.8	5.7	1.9	32.0	22.3	5.5	12.2
Alsike clover	90.3	8.4	1.5	42.5	23.4	6.7	22.3
White clover	90.3	11.5	1.5	42.2	27.5	5.2	18.1
Crimson clover	90.4	10.5	1.2	34.9	20.5	4.0	13.1
Alfalfa	91.6	11.0	1.2	39.6	21.9	5.1	16.8
Cowpea	89.3	10.8	1.1	38.6	19.5	5.2	14.7
Soja-bean straw	89.9	2.3	1.0	40.0	17.5	4.0	13.2
Pea-vine straw	86.4	4.3	0.8	32.3	14.3	3.5	10.2
Silage.							
Corn	20.9	0.9	0.7	11.3	2.8	1.1	3.7
Clover	28.0	2.0	1.0	13.5	.....	.....	.....
Sorghum	23.9	0.6	0.2	14.9	.....	.....	.....
Alfalfa	27.5	3.0	1.9	8.5	.....	.....	.....
Grass	32.0	1.9	1.6	13.4	.....	.....	.....
Cowpea vine	20.7	1.5	0.9	8.6	.....	.....	.....
Soja bean	25.8	2.7	1.3	8.7	.....	.....	.....

TABLE II.—AVERAGE DIGESTIBLE NUTRIENTS AND FERTILIZING CONSTITUENTS IN AMERICAN FEEDING-STUFFS—*Continued.*

NAME OF FEED	Dry Matter in 100 Pounds	Digestible Nutrients in 100 Lbs.			Fertilizing Constituents in 1,000 Lbs.		
		Protein	Fat	Carbohy- drates	Nitrogen	Phosphoric Acid.	Potash
CONCENTRATES—Cont'd.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Barnyard millet and soja bean..	21.0	1.6	0.7	9.2	.....	.....	.....
Corn and soja bean	24.0	1.6	0.7	13.0	.....	.....	.....
Roots and Tubers.							
Potato	21.1	0.9	0.1	16.3	3.2	1.2	4.6
Beet, common	13.0	1.2	0.1	8.8	2.4	0.9	4.4
Beet, sugar	13.5	1.1	0.1	10.2	2.2	1.0	4.8
Beet, mangel	9.1	1.1	0.1	5.4	1.6	0.9	3.8
Flat turnip	9.5	1.0	0.2	7.2	1.8	1.0	3.9
Rutabaga	11.4	1.0	0.2	8.1	1.9	1.2	4.9
Carrot	11.4	0.8	0.2	7.8	1.5	0.8	5.1
Parsnip	11.7	1.6	0.2	11.2	1.8	2.0	4.4
Artichoke	20.0	2.0	0.2	16.8	2.6	1.4	4.7
MISCELLANEOUS.							
Cabbage	15.3	1.8	0.4	8.2	3.8	1.1	4.3
Spurry	20.0	1.5	0.3	9.8	3.8	2.5	5.9
Sugar-beet leaves	12.0	1.7	0.2	4.6	4.1	1.5	6.2
Pumpkin, field	9.1	1.0	0.3	5.8	.....	.....	.....
Pumpkin, garden	19.2	1.4	0.8	8.3	1.1	1.6	0.9
Prickly comfrey	11.6	1.4	0.2	4.6	4.2	1.1	7.5
Rape	14.0	1.5	0.2	8.1	4.5	1.5	3.6
Acorns, fresh	44.7	2.1	1.7	34.4	.....	.....	.....
Dried blood	91.5	52.3	2.5	.0	135.0	13.5	7.7
Meat scrap	89.3	66.2	13.7	.3	113.9	7.0	1.0
Dried fish	89.2	44.1	10.3	.0	77.5	12.0	2.0
Beet molasses	79.2	9.1	.0	59.5	14.6	0.5	56.3
Beet pulp	10.2	0.6	.....	7.3	1.4	0.2	0.4
Cow's milk	12.8	3.6	3.7	4.9	5.3	1.9	1.8
Cow's milk, colostrum	25.4	17.6	3.6	2.7	28.2	6.6	1.1
Skim milk, gravity	9.6	3.1	0.8	4.7	5.6	2.0	1.9
Skim milk, centrifugal	9.4	2.9	0.3	5.2	5.6	2.0	1.9
Buttermilk	9.9	3.9	1.1	4.0	4.8	1.7	1.6
Whey	6.6	0.8	0.3	4.7	1.5	1.4	1.8

AVERAGE DIGESTIBILITY OF AMERICAN FEEDING STUFFS, WITH ADDITIONS
FROM THE GERMAN TABLES.

The data of this table are mainly from digestion trials conducted by American Experiment Stations, as compiled by Lindsey in the report of the Massachusetts (Hatch) Experiment Station for 1896. Coefficients from this source are marked "M" in the last column of the table. To render the table more complete, additions have been made from the German tables. Those marked "L" are from Mentzel & Lengerke's Landw. Kalender for 1898. Those marked "K" are from Zusammensetzung der Futtermittel, Dietrich and König.

A. Experiments with Ruminants.

FEEDING STUFFS.	No. of Trials.	Dry matter.	Protein.	Crude fiber.	Nitrogen-free extracts.	Ether extract.	Authority.
CONCENTRATES.		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	
Dent corn.....	12	91	76	58	93	86	K.
Corn meal.....	5	88	60	.....	93	92	M.
Corn cob.....	2	59	17	65	60	50	M.
Corn and cob meal.....	3	79	52	45	88	84	M.
Gluten meal.....	8	87	88	.....	88	93	M.
Gluten meal (Chicago).....	2	88	89	.....	93	93	M.
Gluten meal (King's).....	2	81	91	.....	79	94	M.
Gluten feed.....	8	84	85	72	87	83	M.
Gluten feed (Buffalo).....	4	83	86	66	84	87	M.
Gluten feed (Pope's).....	2	87	86	77	90	81	M.
Gluten feed (Peoria).....	2	86	83	78	90	79	M.
Gluten feed (Atlas).....	2	80	73	.....	84	91	M.
Maize feed (Chicago).....	2	84	84	72	85	90	M.
Cream gluten (Pope's).....	2	93	84	.....	88	98	M.
Wheat bran.....	11	61	79	22	69	68	M.
Wheat bran, spring wheat.....	2	63	80	24	70	76	M.
Wheat bran, winter wheat.....	3	62	77	27	65	64	M.
Wheat middlings.....	4	79	82	36	85	85	M.
Rye meal.....	2	87	84	.....	92	64	M.
Barley.....	4	86	70	50	92	89	L.
Malt sprouts.....	1	67	80	34	69	100	M.
Brewers' grains, wet.....	12	63	73	40	62	86	L.
Brewers' grains, dried.....	2	62	79	53	59	91	M.
Oats.....	39	70	78	20	76	83	L.
Rice meal.....	12	75	63	26	86	85	L.
Flax seed.....	7	77	91	61	55	86	L.
Linseed meal, old process.....	3	79	89	57	78	89	M.
Linseed meal, new process.....	3	80	85	74	84	93	M.
Cottonseed.....	2	66	68	76	50	87	M.
Cottonseed, roasted.....	2	56	47	66	51	72	M.
Cottonseed meal.....	6	76	88	32	64	93	M.
Cottonseed hulls.....	13	41	6	47	34	79	M.

AVERAGE DIGESTIBILITY OF AMERICAN FEEDING STUFFS—Continued.

FEEDING STUFFS.	No. of Trials.	Dry matter.	Protein.	Crude fiber.	Nitrogen-free extracts	Ether extract.	Authority.
CONCENTRATES—Continued.		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	
Cottonseed hulls, when fed with cotton-seed meal.....	3	41	.....	38	49	78	M.
Cottonseed hulls, when fed with cottonseed meal.....	11	45	.....	46	51	76	M.
Cottonseed feed (hulls and meal)....	3	46	45	37	50	82	M.
Cottonseed feed (hulls and meal)....	11	55	62	46	54	85	M.
Pea meal.....	2	87	83	26	94	55	M.
Soja-bean meal.....	10	79	87	.....	73	85	M.
Peanut feed.....	2	32	71	12	49	90	....
ROUGHAGE.							
<i>Fodder corn, field cured.</i>							
Dent and flint varieties, average ...	23	68	55	65	73	74	M.
Dent, mature	14	66	48	57	72	76	M.
Dent, in milk.....	11	63	50	64	66	75	M.
Dent, immature, B. & W. (coarse)...	4	57	27	59	61	76	M.
Dent, immature, no ears formed....	8	65	62	71	64	66	M.
Flint, mature.....	9	71	65	76	73	70	M.
Flint, ears just forming.....	3	70	70	72	71	67	M.
Sweet, mature....	6	67	64	74	68	74	M.
<i>Corn stover, field cured.</i>							
Corn stover, all varieties.....	8	60	45	67	61	62	M.
Corn stover.....	4	62	52	67	64	52	M.
Corn stover, shredded, fed dry.....	2	57	40	65	56	72	M.
Corn stover, shredded, fed wet.....	2	60	36	70	59	74	M.
Corn stover, tops and blades... ..	2	60	55	71	62	71	M.
Corn stover, leaves	2	56	56	61	59	53	M.
Corn stover, stalk below ear.....	2	67	21	74	69	80	M.
Corn stover, stalk above ear.....	2	55	22	71	54	64	....
Corn stover, husks.....	2	72	30	80	.....	33	M.
Corn stover, leaves below ear.....	2	65	35	78	68	56	M.
<i>Corn forage, green.</i>							
Dent fodder corn, average glazing and mature.....	13	66	53	52	74	76	M.
Dent fodder corn, mature.....	4	65	51	55	72	73	M.
Dent fodder corn, glazing.....	9	67	54	51	75	78	M.
Dent fodder corn, in milk.....	9	70	61	64	76	78	M.
Dent fodder corn, immature.....	11	68	66	67	71	68	M.
Dent fodder corn, glazing, B. & W. (coarse)	2	52	24	46	59	78	M.
Sweet fodder corn, roasting ear stage	6	72	62	60	77	79	M.
Sweet fodder corn, in milk.....	2	77	77	75	81	74	M.

AVERAGE DIGESTIBILITY OF AMERICAN FEEDING STUFFS—Continued.

FEEDING STUFFS.	No. of Trials.	Dry matter.	Protein.	Crude fiber.	Nitrogen-free extracts.	Ether extract.	Authority.
ROUGHAGE.—Continued.							
<i>Hay from grasses.</i>		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	
Meadow hay, rich in protein.....	48	67	66	63	68	57	L.
Meadow hay, medium in protein....	94	61	57	60	64	53	L.
Meadow hay, poor in protein.....	28	56	50	56	59	49	L.
Timothy, all trials.....	26	57	48	52	63	57	M.
Timothy, cut in bloom.....	5	60	56	58	63	57	M.
Timothy, cut soon after bloom.....	10	53	45	47	60	53	M.
Orchard grass.....	3	56	60	61	55	55	M.
Redtop.....	3	60	61	61	62	51	M.
Hungarian.....	2	65	60	58	67	64	M.
Mixed, rich in protein.....	20	58	58	60	59	48	M.
Mixed, medium in protein.....	2	.....	40	49	58	50	M.
Rowen, average.....	8	65	68	66	64	47	M.
Dried pasture grass.....	1	71	72	77	73	60	M.
Barley hay.....	4	59	65	62	63	41	M.
Oats and vetch.....	2	58	60	66	54	19	M.
Timothy and clover, poorly cured...	2	55	38	53	60	58	M.
Blue-joint grass (<i>Calamagrostis Canadensis</i>) in bloom.....	2	69	70	72	69	52	M.
Blue-joint grass, past bloom.....	1	40	57	37	43	37	M.
Wild-oat grass (<i>Danthonia spicata</i>)	3	64	58	68	65	50	M.
Cats-tail millet (<i>Pennisetum spicatum</i>).....	2	62	63	67	59	46	M.
Johnson grass.....	1	55	45	58	54	39	M.
Witch (quack) grass (<i>Triticum repens</i>).....	4	61	58	62	66	57	M.
Sorghum fodder (leaves).....	2	63	61	70	65	47	M.
Sorghum bagasse (stalks after juice is removed).....	1	61	14	64	65	46	M.
Swamp hay.....	2	39	34	33	46	44	M.
Salt hay of black grass (<i>Juncus Gerardi</i>).....	2	60	63	60	56	41	M.
Low meadow fox grass (<i>Spartina juncea</i>).....	2	53	57	51	52	24	M.
High-grown salt hay (largely <i>Spartina juncea</i>).....	2	53	63	50	53	47	M.
Branch grass (<i>Spartina juncea</i> with <i>Spartina stricta</i> , var. <i>glabra</i>).....	2	56	62	52	54	31	M.
Buttercups (<i>Ranunculus acris</i>).....	2	56	56	41	67	70	M.
White weed (Ox eye daisy) (<i>Leucanthemum vulgare</i>).....	2	58	58	46	67	62	M.
<i>Straw and chaff.</i>							
Wheat straw.....	7	43	11	52	38	31	L.
Rye straw.....	9	46	21	60	37	32	L.
Oat straw.....	19	48	30	54	44	33	L.
Barley straw.....	5	53	20	56	54	42	L.
Soja-bean straw.....	4	55	50	38	66	60	L.
Oat chaff.....	2	42	38	45	49	48	L.
Wheat chaff.....	2	26	6	37	29	34	L.

AVERAGE DIGESTIBILITY OF AMERICAN FEEDING STUFFS—Continued.

FEEDING STUFFS.	No. of Trials.	Dry matter.	Protein.	Crude fiber.	Nitrogen-free extracts.	Ether extract.	Authority.
ROUGHAGE.—Continued.							
<i>Grasses, green.</i>		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	
Pasture grasses, mixed.....	4	71	70	76	73	63	M.
Timothy.....	5	58	50	52	64	47	L.
Orchard grass, in bloom.....	1	56	59	51	54	51	L.
Oat fodder, in bloom.....	2	64	75	60	63	70	M.
Rye, formation of heads.....	2	74	79	80	71	74	M.
Sorghum, average.....	4	67	46	59	74	74	M.
Barley, in bloom.....	4	67	72	61	71	60	M.
Hungarian grass, early to late bloom	8	63	63	70	67	62	M.
Barley and peas, full bloom.....	2	60	77	43	61	60	M.
Oats and peas, bloom (?).....	2	68	81	57	66	74	M.
Rowen grass, mostly timothy, two-thirds grown.....	2	66	72	64	68	52	M.
<i>Hay from legumes.</i>							
Red clover, in bloom.....	46	61	62	49	69	62	L.
Red clover, late bloom, fair quality	2	55	55	46	64	53	M.
Red clover, good quality.....	2	52	49	48	58	43	M.
Alsike.....	3	62	66	53	71	50	M.
White.....	1	66	73	61	70	51	M.
Crimson.....	9	62	69	45	62	44	M.
Alfalfa.....	28	60	74	43	66	39	L.
Alfalfa, late bloom.....	2	.....	77	49	64	54	M.
Alfalfa, stage not given.....	1	.....	69	43	72	48	M.
Cowpea-vine, fair quality.....	2	59	65	43	71	50	M.
Soja-bean.....	2	62	71	61	69	29	M.
Vetch.....	6	65	76	54	66	60	L.
Serradella, in bloom.....	2	62	75	50	63	65	L.
Peanut vines.....	2	60	63	52	70	66	M.
Sanfoin.....	2	62	70	36	74	66	L.
<i>Legumes, green.</i>							
Red clover, late bloom.....	2	66	67	53	78	65	M.
Rowen, late bloom.....	2	61	62	52	65	61	M.
Crimson clover, late bloom.....	3	69	77	56	74	66	M.
Alfalfa.....	2	67	81	45	76	52	L.
Cowpea, ready for soiling.....	2	76	74	57	84	59	M.
Soja-bean, before bloom.....	2	66	79	50	72	54	M.
Soja-bean, seed half grown.....	2	62	69	41	73	54	M.
Canada peas, just before bloom.....	2	71	82	62	71	52	M.
<i>Silage.</i>							
Dent corn, grain milk stage to mature.....	17	64	52	62	69	85	M.
Dent corn, immature.....	13	64	54	70	66	71	M.
Dent corn, stage uncertain.....	4	60	24	56	68	70	M.
Dent corn, fine crushed (steers)....	2	64	38	75	65	76	M.

AVERAGE DIGESTIBILITY OF AMERICAN FEEDING STUFFS—Continued.

FEEDING STUFFS.	No. of Trials.	Dry matter.	Protein.	Crude fiber.	Nitrogen-free extracts.	Ether extract.	Authority.
ROUGHAGE.—Continued.							
<i>Silage.</i> —Continued.		Per cent.	Per cent.	Per cent.	Per cent.	Per cent.	
Dent corn, fine crushed (sheep) . . .	2	54	22	64	55	58	M.
Dent corn, uncooked, ears mature . .	1	...	45	59	71	86	M.
Dent corn, cooked, ears mature . . .	1	...	39	70	79	87	M.
Flint, ears glazing	11	75	65	77	75	82	M.
Sweet, some ears matured	2	68	54	71	72	83	M.
Soja-bean	4	55	66	49	57	61	M.
Cowpea vine	4	60	57	52	72	63	M.
Barnyard millet and soja-bean	4	59	57	69	59	72	M.
Corn and soja-bean	3	69	65	65	75	82	M.
<i>Roots and tubers.</i>							
Potato	23	85	61	...	90	...	L.
Potato	3	77	44	...	91	...	M.
Beet, mangel	18	88	77	...	96	...	L.
Beet, mangel	2	79	75	43	91	...	M.
Sugar beet	28	89	62	...	95	...	L.
Sugar beet	2	95	91	100	100	50	M.
Turnip, flat	2	93	90	100	97	98	M.
Rutabaga	2	87	80	74	95	84	M.
MISCELLANEOUS.							
Cow's milk	5	98	94	...	98	100	L.
Acorns, fresh	2	88	83	62	91	88	L.
Dried blood	2	63	62	...	100	100	L.
Meat scrap	5	93	93	...	...	98	L.
Fish guano	2	...	90	...	...	76	L.
Beet pulp	7	82	63	83	84	...	L.

B. Experiments with Pigs.

Corn meal	4	92	86	40	95	76	L.
Corn meal	2	90	88	39	94	80	M.
Corn kernels, whole	1	83	69	38	89	46	M.
Corn and cob meal	1	76	76	29	84	82	M.
Pea meal	1	90	89	78	95	50	M.
Barley meal	8	82	76	15	90	65	L.
Barley meal	1	80	81	49	87	57	M.
Wheat, whole	?	72	70	30	74	60	M.
Wheat, cracked	?	82	80	60	83	70	M.
Wheat shorts	2	77	73	37	87	...	M.
Wheat bran	2	61	75	34	66	72	M.
Rye bran	2	67	66	9	75	58	L.
Potato	8	93	73	55	98	...	L.
Potato	4	97	84	...	98	...	M.
Dried blood	1	72	72	...	92	...	L.
Flesh meal	8	92	97	...	...	87	L.
Sour milk	1	95	96	...	99	95	L.

HOW TO GET THE FULL VALUE OF YOUR CORN CROP.

BY ALTON M. WORDEN, Tullahoma, Tenn.

The day has come when we must farm scientifically or not farm at all. High-priced land, stock, help, teams, tools and taxes are here. But cheer up, brothers, for higher ones are to come.

The farmers North have found the silo an absolute necessity on high-priced lands. Scores of them witness that the silo is the only solution of the problem of stock-raising on such land, and stock-raising the only method of maintaining the soil in a productive state and marketing the produce at a profit. Careful experiments show that it takes about 34 pounds of feed (seven of that in good grain) to make one pound of beef gain. So in feeding on the farm we return about three-fourths of the fertilizer, or more, to our soils to build them up and on an average save 97 per cent of the freight we would pay if we marketed our hay and grain. If we should market them in butter, cheese and eggs, we save far more yet, both in freight and fertilizers.

The steer, the goat, the sheep, the hog, the young mule or colt, the hens are simply machines to condense our transportation, and at the same time retain the maximum amount of plant food for our soils.

Prof. Henry, one of the greatest feeding authorities, says, "It takes 54.9 per cent of his feed to sustain life in the ox, the sheep 56.6, and the pig 46.6." This shows why rapid feeding is most profitable and how a man may prolong the feeding period to such an extent that his feed is all consumed simply to sustain life. It logically follows also that we must make our feeding periods short, and to do this and to make great gains we must provide a feed that can be eaten readily, in large quantities and well digested. That is silage, every time, and only silage.

It is impossible for any animal to consume and assimilate enough coarse dry feed and corn to make a rapid, profitable growth and gain fine tender meat. I never made a satisfactory meal of dried apples. I prefer canned peaches, and there is just about the difference between the average dry feed and silage that would be in dried apples or canned fruit. My stock all like silage and all eat liberal rations of it from grass to grass again. The silo is not a new thing, in fact, it is very old. Though not numerous in the South, it is rapidly coming into use here.

Among the great advantages of the silo is saving the feed perfectly in very wet seasons. I have had three-fourths of my corn to spoil in the field by rotting in the shock. The silo will save perfectly corn, clover, peas, soy beans, alfalfa or sorghum. No matter how heavy the crop or rainy the season, they can be cut in the rain or put up between

showers and kept perfectly. Five times as much feed can be stored in the same space and be better kept. Do not put in any hollow-stalk plants, as oats, rye or wheat in the silo. They will not keep well.

In the silo the whole crop is stored safe from the rats, mice, squirrels, weevils, birds or stock, also from damage by storms.

It is much more cheaply harvested than by the usual methods. We figure our cost from 60 to 75 cents per ton for harvesting, cutting and packing the crop into the silo.

A great advantage is the entire crop is taken off from the land clean and clear early in the season and the land left ready for cover crops. No waiting for the corn to cure out or drilling around the shocks. We always put on cover crops, on all land under the plow, leaving nothing open for winter winds and rains to blow or wash away.

All crops for silage should be fully matured but not dry. Immature, green crops make sour, thin silage. Dry corn makes good feed if put up with plenty of water. There is no danger of too much water on it; if in doubt, add more water.

The silo is the only way to save frosted corn and get its full value. Cut it and rush into the silo at once.

Silage makes more and better meat, milk, and better calves than any other method of feeding.

Stock grow in winter as well as in summer if well cared for.

It is easy to gauge the rations accurately.

It is a durable and cheap storage. A concrete silo is fireproof and not very expensive.

Stock fed silage are far more healthy. One farmer writes, "We do not have one sick animal where we used to have ten or more."

It makes far more and a better manure. The cobs and stalks are all eaten and digested. Full values are recovered from the whole plant both as a feed and fertilizer.

Corn cobs are very rich in potash, and when dried hard are very slow to rot, thus losing the entire value as a food and tying up for years maybe the fertilizer value, robbing the soil to that extent.

The man who feeds ten head without a silo for a year loses the cost of the silo and still has none.

Thousands of farmers and scientists add their testimony and proclaim positively that the silo pays for itself in one year; that it doubles or even quadruples the value of the feed crop. An acre of good silage will keep a cow or steer one year.

Corn and soy beans, mixed half and half, make a well balanced ration—one of the best we ever fed, making June butter in January.

It is far superior and at half the cost of cottonseed feeds. It is a regular savings bank in dry falls and cold, wet springs, when pastures are poor. Keeps the cattle coming all the time.

ECONOMY OF THE SILO.

In an address on the subject of silos at a Western meeting, J. E. Dorman, of the United States Department of Agriculture, compares silage with hay on the basis of space required for each. He said:

"Silage contains about 75 per cent moisture, and for this reason the economy in storing has been questioned. It requires 400 cubic feet to store one ton of hay and 50 cubic feet to store one ton of silage. Therefore, eight tons of silage can be stored in the same space required for one ton of hay. One ton of hay contains about 1,800 pounds of dry matter, while eight tons of silage contain 4,200 pounds of dry matter, more than twice as much.

"Again, one ton of alfalfa hay contains about 1,000 pounds of digestible nutrients. Eight tons of silage, which can be stored in the same space, contain 2,100 pounds of digestible nutrients, or more than twice as much. Corn is recognized as the best silage, although other crops are used with success. He said: 'Those who have used silos are the boosters for them, and those who argue against them have never used them.'"

COOPERATION IN LIVE STOCK SHIPPING.

A growing tendency is the organization of live stock shipping pools. Popularly this is known as cooperative marketing. Iowa has a number of such organizations which are mainly neighborhood affairs. Properly managed, they offer many advantages to shippers and commission men are soliciting the business they produce. Each contributor to a consignment marks his property so that it may be identified at the stock yards. The stuff is sold for the account of individual owners, freight and selling charges are prorated, and each member of the pool receives prompt returns from the commission house. The system is designed to curtail the operations of the old-time professional shipper, who is handicapped by present high costs and by the knowledge on the part of the grower of intrinsic values.

Hens will lay better when fed those foods which they like. If left alone a hen will balance her own ration with palatable foods. She does not like musty grains or spoiled meats, etc.

THE VALUE OF FORAGE CROPS FOR GROWING PIGS.

Washington, D. C., Feb. 27.—Farmers and pig growers do not always appreciate the value of green fields and succulent pastures for their animals. Too often the hog is considered a scavenger and his ability to use waste is regarded as his chief value. However well he serves this purpose, he will pay well for good care, feed and housing.

Forage crops are especially beneficial to young growing animals. It is possible to grow them much more profitably and successfully when a good green field of palatable and nutritious pasturage is provided. Experiments and practical farmers' experiences prove that gains in weight are made at less cost on forage than in the dry lot. Brood sows can be carried through the season on pasture at less cost than when grain fields are entirely depended upon. Foraging induces the animal to exercise and obtain fresh air, and these prevent diseases being contracted, and when the animals are put in the fattening pen their gains are usually rapid and profitable. The green feeds eaten are of much value to keep the pig's digestive system in good condition and the appetite keen.

The entire hog herd can be run on forage crops and will profit by this method of management. Younger animals seem to derive the most benefit, and fattening hogs the least. Herd sows and the herd boar are benefited by having green feeds. It is a good plan to have the brood sow running on green pasture at farrowing time, as this is conducive to a strong, healthy litter of pigs. She should be kept on green forage from the time she farrows. The young pigs will soon learn to eat, and the exercise and the green food in its natural state will start them along in good condition.

The method of feeding when on pasture will necessarily vary according to the kind of crop used. If the crop be rape, alfalfa, clover, cowpeas, soy beans or other crops high in protein content, the grain ration need not be supplemented by feeds high in protein. If blue grass, rye, oats or other non-leguminous crops are grown, it is best to add a small percentage of feeds high in protein to the grain. Corn or barley usually furnish the bulk of the grain ration, and when necessary these can be supplemented by adding one-tenth linseed oil meal or one-sixteenth tannage. The rate of feeding will depend on the grains desired. Considering a full grain ration to be four pounds daily per 100 pounds live weight, we may say that for ordinary work with growing shoats a one-half grain ration, or two pounds a day for each 100 pounds live weight will give satisfactory results. If it is desired to make faster gains a heavier grain ration can be used, and if it is desired to

maintain the animals as cheaply as possible a smaller percentage should be fed.

It seems doubtful if it ever pays to try to keep pigs on forage crops alone. These crops are sometimes sufficient to keep the pigs growing, but the grains are not usually made economically. Usually the pigs are kept at a loss in live weight. Where brood sows are kept they should be given enough grain to keep them in good thrifty condition. The fact that the forage crops have high value when grains are fed does not mean that they should be fed alone.

The crops best adapted to grazing with pigs are alfalfa, rape, clover, blue grass, Bermuda, rye, oats, soy beans and cowpeas. The nature of the soil, the climate and the rainfall are influences that should govern the selection of the crops to be used. Alfalfa is the greatest forage crop on soils suited to its growth. Rape and clover are also excellent feeds, and both are high in protein, the element needed to balance ordinary grain feeds.

Farmers are urged to plan some system of forage crops for their hogs. Now is the time to plan some fields to be sown to crops adapted to grazing. If permanent pastures are available, fence off a portion for the pigs and plant some crop to keep the pigs growing when the permanent pastures dry up, and the returns from the years' work with hogs will be proportionately increased. Give the pig an honest chance to make you money by giving him green feeds in their natural state, and his growth, health and pork-making ability will be increased.

NEW FOOD FOR CATTLE.

Germany is evolving an ever-increasing number of potato products, and thus rapidly solving the problem of disposing of the once enormous surplus of this crop. A number of establishments in that country are now turning out quantities of dried potatoes in various forms, for use in feeding cattle. According to a recent consular report, dried potatoes do not cause the forms of sickness that result from a diet of raw potatoes. Moreover, raw potatoes can be preserved for only a limited time, while to boil the potatoes would impose upon the stock raiser more expense than the circumstances justify. Official tests have proved that a third of the strengthening food generally given to horses in the form of grain could be replaced by dried potatoes, and such animals kept in excellent condition.—*Scientific American*.

Charcoal is one of the best disinfectants and purifiers of the animal system.

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IN THIS ISSUE:

The Railroads and the Farmer.

Give the City Boy a Chance.

Relation of Good Roads to Agriculture.

Land Plaster or Gypsum. Organization and Cooperation.

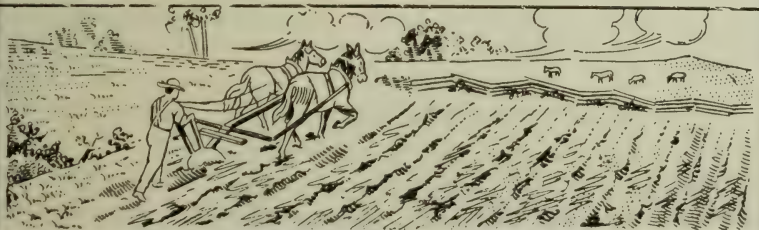
Sweet Potato Culture and Storage.

Trucking as a Side Line in Farming.

The South and the Railroads.

The Farm That Won't Wear Out.

Coming Back to Tennessee. March Crop Report.



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THE RAILROADS AND THE FARMER.

BY T. F. PECK, COMMISSIONER OF AGRICULTURE.



During the coming summer and fall the demagogue in politics is going to be busy, as he is every time he wants the votes of the dear people, about whom he is so solicitous. But it is always just before elections that he is so solicitous about them.

Do not understand me to say that because a man is in public life or a candidate for office that he is a demagogue. I do not mean anything of the kind. But if the voter will do a little thinking for himself he will be able to pick the

demagogue without much fear of a mistake.

The demagogue's pet hobby for the past few years, since our national government has found it necessary to regulate some of the trusts, has been abusing the trusts, styling all corporations as trusts. Before that the railroads were the objects of his wrath and denunciation.

Trusts should be regulated, and railroads should recognize the rights of the people they serve, and when they fail to do so there should be laws to compel them. While that is true, they have rights that should be respected.

We have a great country, rich in resources and possibilities, but the development of those resources, to give them commercial value, requires in many cases large initial investments of capital, more than can be available except by the combining of such capital. By doing so, idle wealth is made active, labor is employed at remunerative wages, raw material is manufactured and goes away to consuming sections, and the money from its sale is returned, to be active in the commercial life of the section where it was produced.

The corporation with large investments, dependent on the public for a market for its products, is not going to "kill the goose that lays the golden egg." Railroads and large mining and manufacturing enterprises have made possible the development of our resources, have

provided for the farmer a market, both at home and abroad, for his products, and they have not been content to stop with that, but all the railroads are taking an active interest in helping the farmer to produce more and better crops and at the same time improve his land.

Take a moment and think of the practical work the railroads are doing for the farmers in transporting delegates to farmers' institutes, in operating demonstration trains in advertising the advantages to be found along their lines for farming, mining, manufacturing and business opportunities, thereby encouraging immigration and bringing more wealth into the country.

But they do not stop at this. They maintain agricultural departments for demonstration work to show the farmers the possibilities of their soils, and the tourist passing through, the agricultural possibilities. In spite of this splendid cooperation on the part of the railroads, the demagogue has tried to curry favor with the farmers by his tirade of abuse of soulless corporations. If the farmers would profit by the examples given of the value of cooperation, they would accomplish more than they have been accomplishing by divided effort. Intelligent business cooperation would result in decreased cost of production, improved quality and increased and uniform quantity of product, resulting in better prices for the farmers.

The Department of Agriculture is working for the improvement of agricultural conditions in the State, and is in a position to know what the demagogue has done for the benefit of the farmer in the past, and what is and has been done by the organizations he so vigorously denounces, and the records are not in his favor.

What has he done to make the Department of Agriculture a power in the development of the paramount industry in the State, an industry that is the basis of the prosperity of all other industries? Until the past few years what has the Department of Agriculture amounted to more than a place to pension men for political activity?

The appropriation for the Department was only considered to meet such demands and not for efficient work in the farmer's interests. Now if the politician is sincere in his desire to be the farmer's friend, let him show it when he appeals to him for his vote, by proposing practical and helpful legislation that will make possible the perfect development of this paramount industry, and when elected, follow his career at the capitol in the Legislature and see if his interest is shown by an effort to do something really worth while for the farmers. By doing so he will have a right to expect the commendation and endorsement

of his supporters. If he wants to help the farmer he can do it better by helpful legislation that will enable the forces working to make their work most effective.

The Department of Agriculture, despite the meager appropriation for its maintenance for the past three years, can point to practical work done of real value to the farmers of the State. Among other things it has eradicated the Texas fever cattle tick from the State, which was causing a loss of more than \$3,000,000 annually to the cattle industry; it has eradicated sheep scabies, preventing another great loss in that industry; it has made substantial progress in controlling the ravages of hog cholera, tuberculosis and black leg in cattle and glanders in horses; it has succeeded in placing live stock sanitary control work on a sane, practical basis.

Correspondingly satisfactory work has been done in the enforcement of the feed, seed and fertilizer laws that will mean the saving of millions of dollars to the farmers of Tennessee. The nursery and orchard inspection work has been in the hands of a competent man, and the honey bee has been recognized for its true worth not alone for honey production, but its even more important work in the thorough fertilization of many important crops.

The Department of Agriculture, while restricted for funds for its work, has not cost the general taxpayers of Tennessee one penny. It has, from its revenues from inspection, turned into the State treasury more than \$25,000 net profit to the State annually. This surplus, as well as every expense of every character, is paid by a special tax by the farmer, in addition to his general tax, and the surplus should be available for the Department to increase the efficiency of its work.

The writer, who is now the Commissioner of Agriculture, and has been directing the work of the Department of Agriculture for the past three years, is not making this appeal for more liberal appropriations for the department because he expects to continue at its head, but because he desires the efficient administration of the Department regardless of who may be its head. He accepted the work he is now doing with the hope that he might do something to awaken more active interest in and support of the most important department of the State government, and is gratified with the evidence of increased interest.

So this appeal to the farmers to demand more recognition of the department so vital to them is not prompted by personal ambitions, but by the hope that the Department may not be handicapped hereafter in serving the farmers of Tennessee.

GIVE THE CITY BOY A CHANCE.

BY T. F. PECK, COMMISSIONER OF AGRICULTURE.

We often hear it said and with much truth, that the majority of men who succeed in the different vocations of life were reared in the country. Boys reared by successful men who came from the country and made their success in the city in many cases do not repeat the successful experience of their fathers.

We hear many arguments made for keeping on the farms the boys raised in the country. I do not believe in keeping the boy on the farm against his inclination. I do think that the boy reared in the country should have an opportunity to know the advantages of agriculture as a vocation; he should have an opportunity to see the better side of farm life. Too many of them, while they get the advantages of outdoor life and grow up strong and vigorous of body and learn self-reliance and self-denial, see only the drudgery side of farming as a vocation and its isolation and inconveniences, and they want to get away from it.

If they had educational and social advantages, if they had opportunities to learn the possibilities for success in farming, a majority of them would remain on the farm from choice, but it is an injustice to the boy to try to hold him on the farm if his mind is made up for some other line of work, and an injustice to the farm, for we do our best work when we are doing work that we like.

Now about the city boy. Is it a square deal to give him no chance to develop naturally and select a vocation according to his inclinations? Is agriculture stressed in the schools of the cities as it should be? I do not think it has been in the past. Very few city-reared boys will ever take up agriculture as a vocation unless they have a chance to learn more about plant and animal life, and see more of conditions where farming is done as it should be done.

I believe fully as many boys reared in the city would select agriculture as a vocation if they had opportunities to learn of its possibilities, as there are boys reared with like opportunities in the country who leave the farm for a vocation in the city.

I think our school curriculum should be broad enough, both in the city and country, to allow all boys to learn more of nature, of plant and animal life, and of that vocation that is the foundation upon which all other vocations are built and are dependent for success. There should be some provision for the city boy spending a portion of his time in the country, to learn something of country life. Whether he selects agriculture as a vocation or not, he will have had some of the beneficial effects of that life in the country that has evidently had so much to do with the country-reared boy making good in the city.

We are rapidly learning how to improve conditions on the farm. We are learning that we have a wider range for development, socially, physically, morally and mentally. The farm boy, now and in the future, will have opportunities to know the attractive side of farm life. The possibilities for success, and the social, educational and health conditions will be so much better that those who are naturally inclined to agriculture will remain there.

But what about the city boy? Is it fair to him to deprive him of the experience in the country that insured the success of his father? The man who was reared in the country and made his success in the city naturally wants his own boy to succeed in life. He does not want to neglect providing him anything that is necessary to insure his success.

Now, with the history of the past confronting us, with the fact that a large majority of successful men in all lines have been reared in the country, it is but justice to the city boy that he be given a chance to make good. Do not seal the book of nature to him. Why not make his education and training as broad as the country boy, then let him select his vocation after he has had an opportunity to know something of real life in the country and the possibilities of agriculture as a vocation.

In connection with the educational institutions in every city there should be a farm nearby, practically equipped and conducted to carry on every phase of farm work, and living accommodations provided to take care of a class of fifty boys at a time. Then arrange that fifty boys from the city schools spend one month during the spring season of the year on that farm, and under a competent instructor do the work of preparation of the soil, selection of seed and planting the crops, and then take up their regular school work. Let the same class the next year spend a month on the farm cultivating the crops, and the third year a month harvesting the crops, and the fourth year devote a month during the winter to feeding, dairy work, repairing farm tools, fences, testing seed, etc.

By the time the boy was through the high school he would have gained an idea of farm work during each season of the year, and some idea of agriculture as a vocation, and the time spent actively in the country would be no detriment to his health and his development physically. Classes could be arranged so that the farm would have a force of fifty boys to do the work each month in the year.

If the boys' parents scruple at his doing what they might regard as the rough work of the farm and override the advantages to him of

the experience, the boy would deserve genuine pity in being unfortunate in having such parents.

There is soon to be established in connection with Peabody College a School of Country Life. Why not let the farm, in connection with that school, provide this chance for the city boy and serve as an object-lesson that other cities all over the country might follow the plan? Then the boys in the cities could have a chance to benefit by whatever it is in country life that has established the impression that the majority of successful men in the city were reared in the country.

Before the war, because of slavery, boys reared on the farm were not expected to take any active part in the work on the farm. They were given educational advantages to equip them for a professional or business career. Land was plentiful and cheap, and when it became depleted from constant cropping it was abandoned and fresh land cleared. There was nothing to emphasize the importance of soil conservation and scientific methods in farming.

After the war the slave labor was gone and the land owners were impoverished. They had more land than they could cultivate as it should be. They were deficient in knowledge of farming. Thus handicapped, life on the farm was one continuous round of drudgery. It was a struggle for existence, and the boy reared on the farm had nothing to encourage him to remain there, and he naturally left it at the first opportunity.

The development of our resources of mineral and timber necessitated building railroads. Manufactories sprang up, business was good, and men with energy and intelligence prospered, luring more and more from the farm in hopes of like success.

But the drain on the producing class of the necessities of life began to be felt. Increased consumption over production caused prices to soar, and far-seeing people realized that the agricultural problem must be given attention. Legislation was sought to encourage increased production. The problems confronting the farmers must be solved. Experiment Stations were established, Colleges of Agriculture provided and both have done a great work.

The possibilities for success in farming have been demonstrated. The educational institutions of the country have realized that their policy of educating the boy away from the farm was wrong; that it had overcrowded the professions; that they were inspiring boys to equip themselves for business and professional careers when those vocations were already overcrowded, so they have revised their curriculum, and the pendulum is now swinging in the other direction.

Let us give the country boy and the city boy a broad education. Let them know what the city and country each offer, and then let them select the vocation that appeals to them most.

RELATION OF GOOD ROADS TO AGRICULTURE.

BY T. F. PECK, COMMISSIONER OF AGRICULTURE.

Where you find a good system of public roads you invariably find improved farms; you find better stock, better homes, better outbuildings. You will also find more and better schools, better churches than you can find where the public roads are neglected.

You will find far better prices for farm land and you will find people eager to locate there. No trouble to keep the farmers there. They have so many advantages on account of good roads they are slow to leave, even if they do have the handicap of long, cold winters, short growing seasons, making it impossible to grow more than one crop a year.

Now let's enumerate some of the advantages we have for agriculture in Tennessee. We have, first, the greatest variety of soils and soils with the capacity of the highest development. We have exposures of this soil to meet the requirements of any crop; we have an equable climate with no extremes of heat or cold. Now the next advantage we have that I will mention, I expect that some of you who have seen your crops burn up will be inclined to question, until you better understand the question of the conservation of moisture and get your land in proper condition for doing so, but one of our greatest assets is our annual rainfall. We have more than 50 inches annually, and when we know how to conserve that rainfall, and get our soil in condition to do so, we can, in a large measure, be independent of ordinary drouth.

We are not limited to one crop a year, but can grow two or more, thus enabling us to grow a money crop for ourselves and a feeder crop for our soils, thereby enabling us to build up our soils and correspondingly increase our profits.

To make a long story short, we have all the advantages of other sections and many that they have not.

With all these advantages we will have to admit that we have not in the past made the progress that other less favored sections have made. There is no use to claim it, when no matter in what direction we travel we are confronted with evidences of neglect and mismanagement. The galled and washed hillsides, dilapidated buildings and fences are mute but unquestioned evidences of that fact. Every loyal, ra-

tional Tennessean wants to see our State developed. We should be ready to encourage any practical measure that will contribute to that end. In the past few years some counties have been active in improving their public roads. Already the good results are shown in better farming methods by the farmers. We see improvements keeping pace with the road improvement. Land values have increased. People from the crowded North are eager to come and settle where they are assured that they will have good roads. As to the question of the cost of roads and taxes, the farmer every year will save in time and wear and tear many times the increased taxes. No money that he spends brings him so large returns as the money he spends in taxes for improved roads. The farmers are realizing this fact, and men who were opposed to good roads two years ago, now, after an opportunity to learn their value, are becoming good roads enthusiasts. As to the direct benefits to the farmer, good roads cuts half into the cost of marketing farm products, makes it possible to engage in certain lines of remunerative work on the farm that he could not engage in without good roads.

Good roads make it possible to develop the country school equal to the city school, something impossible with bad roads.

With good roads the social life of the farmer and his family is improved and broadened. Better churches will also result. Service of the telephone and rural free delivery will be extended with road development.

Before we had any good roads the tendency was to live in the towns and cities, but with the development of good roads we see a remarkable change. If you go out on the pike roads leading out from any of our large cities you will see magnificent country homes of rich business and professional men. They were hungry for the country, and when good roads made it possible they followed their natural inclination and made their homes in the country. Go to the city and you will find residential sections once occupied by such men now given up to boarding houses, and with the development of good roads this will be increased until only those because of their business compelling them to do so will reside in the cities.

All this will have a wholesome effect on the country boys and girls. They will better realize the possibilities for home life in the country, and they will be more contented with life on the farm, will qualify for scientific farming because they will take a pride in their vocation.

There is nothing in my opinion will encourage the development of our State in all lines so much in proportion to the cost as money intelligently spent in the development of our highways.

While I am opposed to spending money without every safeguard, that we will get 100 cents in road value for every dollar spent, I am in favor of and regard as a good investment sufficient funds to build a first-class system of improved roads in every county in Tennessee.

We are going to have such a system before many years because the work is well started and what has been done will prove the value so conclusive that the work will continue until our road system is complete.

You who want to see our State developed, who are leading this movement for good roads, have a great responsibility resting upon your shoulders. The success of the work and its early completion depends much upon the good business judgment exercised in the right location of the roads and the judicious expenditure of money in building.

A word about the proposed highway connecting Chattanooga, Knoxville and the towns on the highway. While it does not touch my home section, it does traverse my home county and will do much to develop it. If we get this highway now it will mean a link in the system of highways that will traverse the whole country, and for that reason it is wise to take time by the forelock and be included in this great system that is sure to be built within the next few years, and that portion of it will be built first where the enterprise of the citizens take the initiative in getting the work started.

OPPORTUNITY.

By T. F. PECK, COMMISSIONER OF AGRICULTURE.

I have heard young people say that if they had the opportunity that the young men and young women had in the earlier days they could accomplish great things, but those opportunities were gone, that all the cheap lands were gone, that there was no chance to become famous in war, that the professions are all crowded.

Did it ever occur to you that opportunities are more plentiful today than was open to our forefathers and mothers, if we will only look in the right direction for them? This we have not been doing. We have been looking for opportunities along professional lines. Our minds have been so intent in this direction that we have been stumbling over opportunities daily in other lines of endeavor. You are not to blame. Your training has been in that direction; our educational system has to a great extent been at fault for this condition, but I am much gratified to see that some of our big, broad-minded educators of today are recognizing the error and are planning their work to correct it.

Anyone familiar with the history of conditions in the South for the past seventy-five years can understand how such a condition could prevail today.

From the early settlement of the South until the Civil War all the labor was done by ignorant negro slaves, under the direction of overseers. Land was cheap and fertile, and instead of thought being given to maintaining its fertility, it was cultivated in a haphazard fashion, with only one object in view, to get as large a crop as possible.

Such a system could only deplete our soils. Then followed the war that took from the South its labor and left the farmers penniless. They had grown up with the idea that any form of labor was menial for negroes, and with that false notion every one who could do so has qualified for some profession or vocation other than farming; our farming lands in Tennessee as a result have, in the main, been in the hands of men who could not do anything else. Is it any wonder that we have galled and washed hillsides, grown up and neglected fields and dilapidated buildings? Our ancestors have placed a serious handicap on the present generation by neglecting the questions of vocational education and it will require the intelligent effort of our educators and scientists of this generation to lift the handicap.

I make an appeal for agricultural education and to enlist your aid in dignifying the vocation of farming. By right it should stand at the head of the list of all honorable vocations, because it is the foundation on which all others depend for subsistence and support. It has been repeatedly demonstrated that when the same intelligence and energy have been given to farming that is given to other vocations, it has proven more remunerative even with all the handicaps surrounding it.

Too many of our boys and girls raised on the farm have seen only the drudgery and isolation. Nothing has been done to develop the attractive side, the independent side, the possibilities of the social side. Our country schools have been given to teachers who were engaged in teaching as a makeshift and stepping-stone to some other profession. Professional careers in the cities have been pictured to our boys and girls, and no wonder they have drifted to the cities.

Educators have it in their power to stem the tide, to be instrumental in popularizing agriculture as a vocation. The men in the majority of cases who have made history came from the farm. Why not open a new field to the bright intellects of our boys and girls, a field that is not crowded, a field where the reward is only limited to the energy and intelligence put into the work?

You may go to the successful business men of the cities and ask

them what is their most cherished ambition, men who have succeeded, and they will tell you that they look forward to the time when they can retire to a farm, where they can have their fine horses, fine cattle, hogs, sheep and poultry; where they can have their vegetables crisp and fresh from their own kitchen garden; where they can have their rich cream and golden butter in all its purity and freshness; where they can grow flowers in profusion; where they can have their spacious lawns, their shady dells; where they can get away from the smoke, the stench, the noise and the wickedness of the overcrowded cities.

We find them now leaving the towns and building on the suburban lines. Every year we find fewer of the rich living in the cities. We find once famous residences turned into boarding houses, and those who can afford it are finding homes in the open country.

The tide is turning and I want to urge teachers to lend their aid to popularizing agricultural education. It does not minimize their present work; it only broadens it. We are not urging a restricted training, for the agriculturist will find need of all that has been taught in your regular course and more. While the vocation is old as the history of man, it is one of the newer sciences. I want to see Tennesseans make the most of their splendid natural advantages, second to no State in the Union. We can only do it by vocational training. I do not expect all our boys to become farmers, for our State is rich in timber and mineral resources that are being developed. Their development demands men with vocational training.

Let us make our educational training as broad as our matchless resources. Then we will have none of the professions or vocations crowded. Instead we will find all prospering, and all their continued prosperity will depend on the prosperity of the agricultural classes.

The Department of Agriculture is bending every energy to stimulate interest in the development of the agriculture of the State. It seeks the cooperation of the educational institutions because they exert a powerful influence on the boys and girls in the selection of their vocation in life.

With domestic science and home economics taught in the schools as it should be, we would soon see its effect in the improvement of the rural homes of the State. They would be homes indeed, and the boys and girls reared there would be loath to exchange them for the drudgery of life as a clerk, sales girl or factory worker in the city.

Most of the diseases which our fowls contract are caused by carelessness on the one hand and too much care on the other.

LAND PLASTER OR GYPSUM.

By T. F. PECK, COMMISSIONER OF AGRICULTURE.

We are constantly receiving letters asking about land plaster or gypsum and wanting to know of its value as a fertilizer. For the benefit of those interested we will say that calcium sulphate, as it exists in the natural state, is known as gypsum or land plaster, and some times as clover plaster. It is composed of 32.5 parts calcium, 46.5 parts sulphur, and 21 parts water. When it is heated to 212 degrees, the water is driven off and it is then known as plaster of paris. This latter material takes up its water again very readily and "sets" or hardens. Gypsum does not appear generally on the market any more, chiefly because farmers have found it out. That is, they have found that they are not justified in using it on their soils, not only because the effects of its continued use are bad, but also because much more satisfactory substitutes have been found of late years.

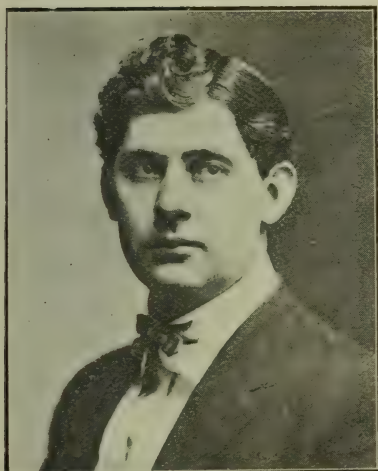
Formerly, gypsum was used very extensively throughout the central west, but after a time it was found that it was injuring the soil. It does not furnish any plant food. It contains no nitrogen, phosphorus or potash, and carries little available lime. It serves chiefly as a soil stimulant and renders available more quickly the potash and phosphorus that is locked up in the soil. Hence, the use of gypsum only hastens the exhaustion of these elements. This accounts for the fact that larger and larger applications were necessary to bring any appreciable results in the crops.

It was used largely as an absorbent in stables, and for this purpose it proves very efficient. It combines with the volatile ammonia in the manure and forms a stable compound, thus preventing the escape of the nitrogen. However, either acid or raw rack phosphate has largely supplanted land plaster for this purpose of late years, since these not only hold the ammonia in an efficient manner, but also add phosphorus to the manure at the same time, an element that the manure is particularly in need of. So farmers have largely outgrown the use of gypsum and consequently very little of it is put on the market.

Have you noticed anything different in the flavor of the milk since you began feeding silage? If there is any change at all the flavor will be a little more pleasant, says O. E. Reed, head of the Dairy Department at the Kansas State Agricultural College. But if the silage is allowed to ferment too long and then fed, the milk will have a taint much like that noticed when weeds are eaten in the summer.

ORGANIZATION AND COOPERATION.

BY A. L. GARRISON.



When asked to write a short article bearing on my work in the Department of Agriculture, I could think of nothing that would facilitate my work more and be more conducive to the best interest of Tennessee agriculture than organization and cooperation. My duties as assigned me are looking after the interest of the farmers in the purchase of field seed, commercial fertilizer and concentrated feed stuffs. It is needless to state that this could be done more effectively and efficiently were there good,

strong organizations in each farming community of the State.

Quoting from a bulletin of the Virginia Department of Agriculture, "We have only to look over the pages of the past to learn the story of the success of combined human efforts." Christ knew the importance of it and bound His disciples into a brotherhood. The feudal lords gathered their clans about them. Washington knew the need of it and gathered thirteen States into a confederation to sweep the power of tyranny off the American continent. All other trades have their unions. Bankers have their associations; manufacturers are using the force of pools; railroads unite small systems into a great syndicate and control every little station from the Atlantic to the Pacific; doctors have their medical societies; lawyers have their bar associations. In fact, every other class of workers and producers are organized. Why not the farmers? It is evident beyond controversy that effective cooperation cannot be had without organization. The terms are inseparable, and when we stop to think of apples being sold at \$2.50 per barrel, and to the consumer at \$5 per barrel, is it not time that growers should work together to make a better distribution of their products when conditions like these exist? Is it not our right and duty to insist that the distributor shall handle the product on a reasonable margin whether he is a wholesaler or retailer? Should we not insist that the product go to the consumer at such prices that we may have the largest possible consumption of our products? Would you

think any manufacturing concern would sit idly by and see the consumption of the articles they produce materially restricted because of exorbitant prices exacted in the cause of distribution? No. Can we ignore the lesson of all the ages? Can we go ahead individually and meet the combined forces of all the financiers of modern life? The slogan of the age is combination. We must cooperate to hold our own amid the battling ranks of twentieth century commercialism. We should soon be no longer individual farmers but members of a great agricultural fraternity. All in a nutshell, we need to pull together hard, determinedly and long, for what we all must concede is necessary to make the foundation of our great country a solid rock base.

SWEET POTATO CULTURE AND STORAGE.

W. R. HAWK BEFORE EAST TENNESSEE FARMERS' CONVENTION AND INSTITUTE.

I hope to give you some of the practices and methods of the most successful growers of sweet potatoes of Madison County, as well as some of the mistakes of those who have failed.

Sweet potatoes, like all other truck crops, require the personal attention of the grower. This attention to detail cannot be trusted to the average hired hand. Failure has resulted in nearly every instance where hired help has been left to do the work without the personal supervision of the grower. A great deal of heavy labor is necessary to grow, store and market a crop of sweets.

Sweet potatoes are a poor man's crop, as well as a thin land crop. It requires no great amount of capital to go into the business. Neither do they require heavy fertilizing. In fact heavy, rich soils give a light yield of poor appearance and quality. Our light, sandy soils of the South give a good yield of the very best quality. However, a fair yield of good quality may be obtained from our red clay soil if it is well drained. Sweet potatoes do not like a wet season, but on the other hand can stand quite long droughts without damage. Checking the growth does no injury, as is the case with the Irish potato.

A rather long rotation is best where the potatoes are to be stored. If the crop is to be sold direct from the field early in the season a short rotation may be practiced. In the latter practice a two-year rotation has been practiced with the most gratifying results.

Most of us prefer sweet potatoes to follow a corn crop that has had cowpeas grown in it, and then sown to a winter cover crop

of grain. Clover sod is not suitable, owing to the excess of nitrogen and insects. If it is desired to use land that has had a leguminous crop of any kind grown on it, a winter cover crop of grain should intervene.

The land should be well pulverized with a disc harrow, roller, drag, etc., both before and after breaking. This preliminary preparation of the soil should extend over a period of four to six weeks before planting. From three to five hundred pounds per acre of any good special potato fertilizer may be drilled in directly under the rows. It is not economical to scatter fertilizer broadcast, as the weeds have a good chance at it. Some of the growers will not use any commercial fertilizer this year as the effect has been almost nothing for the last two years. One grower hauls manure from town during the winter and throws it in large piles in his field. When ready to set plants this manure is drilled by hand in furrows beneath the rows. Not more than one or two cords of this manure is used per acre. This grower gets good yields from thin land and has less loss from black rot after storage than any other grower.

High ridge culture has given us the best yields as well as being much easier to harvest. It would be almost impossible to harvest a crop grown on the level in a wet season.

When ready to set plants the fertilizer, when used, is drilled in rows three and a half to four feet apart. Two or four furrows with a turn plow is then thrown on the fertilizer. The plants are set from eighteen to thirty inches apart on this high ridge without any further preparation. Plants should not be drawn from the bed until the leaves have a matured appearance. They may be set at any time during the day if care is taken to prevent them wilting before the soil is well firmed around the roots. Most of the growers set plants by hand, as that is the fastest and best way. However, they may be dropped and the roots pressed into the soil with a stick and the dirt firmed around them with the foot. If the soil is dry plants can be watered before firming the soil. In that case a hoe can be used to draw loose soil around the plant as soon as the water is poured around the plant.

The season for setting plants extends from about the first of May till the middle of July. The most satisfactory yields and quality are obtained from plants set from May 20th to June 20th. Good crops can be grown from tips—that is, pieces of vines some twelve inches long—pushed into the ground, leaving about four inches above the soil. The first half of July is the best time for setting tips.

The cultivation is shallow and intensive. The bunch yam is as easy to cultivate as cotton. The long vining varieties may be cultivated without hand turning of vines if the cultivator is run the same way each time in the spaces between the rows. The fourteen-tooth cultivator, heel sweeps and large cotton sweeps are used largely in the cultivation and so well and often is the work done that very little hand hoeing is necessary. The cultivation is continued so long as it is possible to get through the rows without damaging the vines.

Harvesting should be done before the tubers are damaged by frost. Rain on frosted vines does no harm. The soil should be in good working condition for harvesting; if very dry and hard the potatoes will be bruised and rot; if too wet a great deal of dirt will hang to them and make them heavy to handle. In harvesting, storing and marketing always handle as though they were eggs. Reject all cut and bruised potatoes. Store in any building that can easily be kept at about 48 to 60 degrees. Allow about three cubic feet of space for each bushel stored and arrange so each bushel will have a fair chance at its part of air.

Most potatoes around Jackson are stored in rooms about two-thirds underground and one-third above. One extensive grower stores in a house built on the ground. It has ten-inch walls packed with sawdust. They are usually placed in bins about three feet wide, five feet high and as long as the room will permit. One grower stores in slatted boxes holding about two bushels. A room partly underground is not so susceptible to sudden changes of weather.

All of above methods have proven good. One grower hired help to harvest his potatoes while he went to town. They handled his potatoes like rocks and of course they all rotted. If temperature is kept as recommended above they will need no covering. When first stored the temperature will run up to 75 or 80 degrees, but don't become alarmed. Give them plenty of air and rest easy. Keep a reliable thermometer in your potato house all the time.

If potatoes begin to rot soon after storage, don't become nervous, they will soon quit if not disturbed. The skin of potatoes, if unbroken, is immune to rot caused by fermentation. Handling breaks the skin and increases the trouble. The skin becomes very tender about twenty hours after digging, hence it is best to store permanently as fast as dug.

Perhaps I had better say something of varieties and markets. Select the variety that will continue to give you the best profit. If for hog feeding plant Red Nansemond for early, and Southern Queen for later use. Corn and potatoes are good for finishing off pork.

Cattle eat sweets greedily and the milk has a delicious flavor. They are good as a relish for horses. If grown for shipping to market, select a variety that is popular in that market. Most Northern markets demand a potato that can be boiled, such as the Southern Queen and the Jersey, while the Southern markets call for a potato that bakes soft and sweet, such as the Bunch Yam and Nancy Hall.

The yield ranges from seventy-five to three hundred bushels per acre. Probably 160 bushels is a fair average of the yam varieties. They sell from forty cents to \$1.25 per bushel. The returns per acre range from \$40 to \$250 gross. The cost of growing, storing and marketing a crop ranges from \$25 to \$75 per acre. Potatoes shrink from 10 per cent to 25 per cent after storing.

Even a discriminating market will use a few potatoes of inferior quality, but the same market will use many times as many potatoes of superior quality. May be our local population has increased 25 per cent in the last two years, but the per capita consumption of potatoes has increased fully 500 per cent. This desirable result has been brought about by introducing better varieties, getting them to the consumer in better shape, keeping the market supplied for a longer season and introducing up-to-date methods in our business. As our local market is good we have never had any potatoes to ship.

Sweet potato growing does not yield the large returns sometimes obtained from other truck crops, but there is a more uniform profit from it than from any other truck crop that I am acquainted with. When looking for a market for your sweet potatoes don't neglect to cultivate and educate your home market.

TRUCKING AS A SIDE LINE IN FARMING.

S. R. OGDEN, CONCORD, TENN., BEFORE EAST TENNESSEE FARMERS' CONVENTION AND INSTITUTE.

The terms trucking and farming are so well understood that time will not be taken to define or distinguish between them. The question as stated recognizes farming as the chief occupation and trucking the side line. The question is whether there is advantage in combining them.

Every man and every farm have their own problems. It is of very great importance that one should make the selection of the line of farming likely to give the best results when starting out, as changes are expensive in both time and money. I have no doubt that conditions exist wherein trucking can be practiced to advantage in combina-

tion with farming. I also believe there are many cases where trucking should never have been attempted and that in many cases it might have been practiced to advantage if different methods had been adopted or different selections of crops made.

Every farmer should give much thought as to what line of farming will bring about the results he desires so as to make the right start. He should make comprehensive plans for the whole farm, for every field in it so as to raise the kind of crops that are likely to make the largest financial returns for the whole farm, not a record-breaking crop of one kind and losing crops on the balance of the farm. Select the crop that can be raised in some satisfactory rotation that will best promote the line of farming he has adopted and then stick to it. He must put his ideals high as to the size of the yields of his crops, and then put brain and muscle at work to produce them, but under no circumstances must he neglect the maintenance of the fertility of the soil.

If trucking crops cannot be used to bring about the above results, I do not think they should be attempted, but where the raising of truck crops will bring about the above results they may be practiced.

There are many things to be considered as to whether conditions justify trucking, too many for present discussion and I will only allude to some of them.

The location of the farm. The man himself, his tastes and inclinations and knowledge of trucking requirements. The amount of cash capital available. The size of the farm. The market conditions. The expense of transportation. The wisdom used in the selection of crops to be raised. Perishable and unperishable crops. Danger of overproduction. Will trucking assist in the maintenance of soil fertility for the farm as a whole? How much will trucking interfere with farm operations?

It has been suggested that the skill and knowledge acquired in the practice of trucking to improve the soil will tend to the better maintenance of soil fertility of the entire farm. If it will do this, truck by all means, and if you can profitably dispose of your products. But my belief is that while in theory it should be true, in practice it is not, and therein lies the greatest objection to the combination.

Location of the Farm.—Where the farm is located at a distance from a market general farming is almost universally the most successful.

The Man Himself.—Every man is likely to succeed best where his work is in line with his tastes and inclinations. He should have some

knowledge of what trucking requires in its production, and equally as much to have the knack of arranging his products attractively and skill in selling them.

Cash Capital Available.—If a man has sufficient capital to run his farm without trucking it is rarely wise to combine them. But when it is true in many or most cases he has put about all the money he has in the purchase of his farm, it is a serious question how to make farming alone a success. A little cash received from truck may tide him through some tight places and also assist in the proper management of the rest of his farm. This is the chief benefit of the combination.

The Size of the Farm.—It is rarely advisable for a man with a large farm to do trucking of any kind. The possibilities of both success and comparative failure on a large farm are too great to divide his efforts and attention. Trucking is an intensive occupation and to succeed it requires the best soil on the farm, all the manure that can be spared, all the attention and no neglect of any kind.

The Market Conditions.—If they are not satisfactory, don't truck. The subject is great enough for several hours discussion—too long to begin.

The Selection of Crops for Trucking.—This is quite important. Some crops might pay and not interfere much with farm operations, while others would require more time than could be profitably given them. Look with suspicion on all perishable crops.

Crops that are most likely to be raised to advantage are watermelons, Irish and sweet potatoes, onions, early beans, provided you can get in first market. I suggest these for the following reasons: Most of these can be raised with the use of fertilizer and not rob the rest of the farm of manure. Watermelons do not require as much time to raise, but to me they are a nuisance to sell. Irish and sweet potatoes can be raised profitably by use of fertilizer and green manures.

The question as to whether to raise any of these or other truck crops is, *how you do it*. If you have to rob the rest of the farm of manure in order to raise them, do not hesitate to cut them out.

They can be raised profitably by using a proper rotation regularly and religiously lived up to—rotations with some variety of clover or rye and vetch and using fertilizer liberally. I say again if you can't raise them that way do not try to raise them at all.

THE SOUTH AND THE RAILROADS.

Never since the foundation of the republic has there been a time when there was so much thinking and talking of the splendid possibilities of the Southern States of the Union as there is in this good thirteenth year of the twentieth century. It may be said that there has not been a time in the past when the people of the South themselves have realized so fully, and with such emphasis, the possibilities of the section as they are now beginning to be realized.

In the days of the past there was a time when the boast was heard that cotton was king. In the industrial and commercial world cotton does sit in the seat of a monarch. Cotton the world must have if clothes are to be worn, and in the growth of cotton the South has next to a monopoly.

But if cotton is king, it is surrounded in this section by a vast family of princes: coal, iron, zinc, marble, copper of the mineral kingdom, and corn and divers products of the soil of the cereal and vegetable kingdoms.

But what is intended here and now is, who and to what may be given the credit of having furnished to the world, and to ourselves, the information of the resources and the possibilities of this section of the country. It will not be considered immodest if it should be here claimed that much of the credit belongs to the newspaper press of the South. If all that has been written and printed in the Southern newspapers, and in the newspapers in other parts of the country, about what nature has done for the South were printed and issued in bound volumes, they would make a carload, if not trainloads, of bound literature.

There has been a general awakening in the States in the South, and they have their agricultural and educational departments in which men are engaged in the establishment of demonstration farms and in building up schools, and in branches of industry, so as to show our own people what a strong foundation they have upon which to build, and how to do the building.

Last, but by no means least, the railroads have been and are doing a vast amount of work and spending hundreds of thousands of money in an effort to develop the resources of the section. If they are doing it from selfish motive, namely, to increase their own business, to add to their own profits, why that detracts nothing from the credit to which they are entitled and which should be cheerfully and gladly allowed.

The great railroad systems of the South have departments, the business of the heads of which is to give their time to the study of the

South and to publish to the world the result of their investigations. Some of them are issuing periodical publications at regular intervals, printed at their own expense, and circulated for the purpose of furnishing reliable information to home-seekers and investors. They are running trains, carrying with them men who have made it a business to study scientific agriculture, who know what is meant by intensive farming, who are experts in fertilization of the soils, and these have already accomplished wonders in many localities. They have awakened an interest here at home never experienced before, and away from the section there are those who, attracted by our climate, are looking to the South as a promised land.

It need hardly be added that it is the interest of the South to give fair treatment to the roads. Those who would by any sort of unfair treatment put a handicap on the railroads should know they are at the same time placing a handicap upon the growth and the prosperity of the South at a time when the section has prospects more brilliant than ever before.—*Knoxville Journal and Tribune*.

COMING BACK TO TENNESSEE.

A news item from Columbia tells about the return of Stephen L. Brown from Temple, Texas, to again make his home in Tennessee.

That is a significant event. It is indicative of a turn in the tide of immigration.

Following the close of the Civil War hundreds of Tennesseans loaded their household goods into white-topped wagons, crowded the women and children into the unfilled spaces, mounted their horses and journeyed to the West, where land was virgin, abundant and practically free. With hard labor and indescribable privations they succeeded in establishing new homes. The more thrifty and the more fortunate met with success and became prosperous. The shiftless and the unfortunate met the fate that befalls their class in every land and clime—they remained poor and dependent upon others for a means of livelihood. The story of the early days of the West is not unlike the story of pioneer days in all other parts of the United States.

The railroads pierced the vast expanses of uninhabited lands. The shrewd real estate dealers followed the railroads. The railroads and the real estate dealers combined to bring more people to the West. One to create a heavier traffic and the other to reap the enormous profits that lay before them.

Soon all the best land was taken up. The influx of settlers was

immense. Towns sprung up like mushrooms in a night. Cities grew with the rapidity of catalpa trees. An unnatural prosperity made money abundant and easy to get. Extravagance and loose spending was the custom. The West became the home of adventurers and speculators, dupes and "easy-marks," along with armies of honest workers and builders, shrewd business men and far-sighted investors.

During that period of development the greatest factor in attracting the attention and interest of the hundreds of thousands who left Tennessee and other older States was publicity.

The railroads and real estate dealers used publicity of every conceivable nature. They advertised in newspapers, by circulars and booklets, by billboard and by personal appeals. But the most common, and probably the most effective, was the personal letter scheme. An entertaining writer in a recent number of the Saturday Evening Post tells how the immigration agent of a Western railroad went through the country traversed by his road and calling on all the farmers wrote typewritten letters at their dictation to the folks back home, describing the marvelous opportunities that awaited the man who wanted a fortune. Real estate dealers provided form letters for people who had bought land from them to copy and send to the people in the community they had left, telling them of their big crops and their phenomenal success. Thousands of the new settlers, seeing the land with that deluding bigness of vision with which a provincial always looks upon new scenes, wrote long letters to the home paper describing their new homes with that extravagant descriptive power that fills the mind before a bad year has struck the crops, and the home papers foolishly published these letters and helped to induce others to follow the beaten trail westward.

Then the day of cheap lands ended. All the more fertile fields were settled and put into cultivation. The settlers toiled through a generation or two and realized that land is land anywhere on the face of the earth, and that it takes hard licks and the sweat of the brow to make mother earth give up her wealth in Texas the same as it does in Tennessee. Life in the West then lost its glamor. Those who succeeded were industrious. Life in the old States was no more prosaic than it had become in the Golden West.

With land as high priced in the West as it is elsewhere, and with all the novelty of Western life gone, the people are beginning to realize that, after all, the South is the best section to live in. Many who pioneered to the West as young men are turning their eyes toward the old home State and longing to dwell again amid the scenes of their

childhood. The thrifty farmers of the North and East who are living in crowded communities and laboring under the burdens of heavy taxes and the high priced demands of thickly settled districts are coming South to make their homes where there is room for eight times as many people as now live here, where land is, comparatively, cheaper than anywhere else in the United States, and where outdoor work can be done almost every month in the year.

All that is needed to make the South boom even as the West boomed fifteen or twenty years ago is to give this section more publicity. Publicity is the thing to make anything boom.

The letter writing method is a good one. Let every person in Tennessee write to someone who has been living in the West and tell him about the prosperity of the old home State, about the bounteous crops, the new railroads, the splendid public roads, the fine system of schools and all the good things that we have, and ask that the letter be published in the home paper of the one receiving it. We don't believe the Western papers will be as simple as the Tennessee papers have been in the past, but maybe a few of them who love the truth so well that they will tell it even when it hurts will publish the letters and in that way help to give the South more publicity.

The man who is returning to Maury County is in the vanguard of the home-coming pioneers and children of pioneers. The next few years will bring a development of the South in every line of human endeavor that will be the most remarkable in the history of this nation of marvelous growth.

The West, the Northwest, California and Canada have had their palmiest and boomiest days. They were as nothing in comparison with what will be witnessed by the present generation in the South.

Wise men with capital already are laying their plans and getting their fingers into many enterprises that will be bonanzas before another decade has passed.

The man who owns land in the South today has an investment that is better than government bonds or the gilt-edged securities of the best railroad in the United States; Standard Oil is no better.

The tide of immigration has been out from the South; now it is coming in and soon the surf will be breaking over Tennessee.—*Jackson Sun*.

Put the windows in the poultry houses low down to the floor, so that the hens will get the benefit of the light and sunshine when scratching for their feed.

THE FARM THAT WON'T WEAR OUT.

The great primary reason why land values have increased so markedly during the last thirty years is that America has no more free land of good quality in humid sections. Civilized man is characterized by hunger for the ownership of land. Our population continues to increase by more than 20 per cent each decade, but all future possible additions to the farm lands of the United States amount to only 9 per cent of the present acreage, and most of this small addition requires expensive irrigation or drainage.

The average yield of corn in the United States is only 25 bushels an acre, and the average net returns even from the farms of the corn belt will not pay 4 per cent interest on their present market value. But the intelligent investment of \$2 an acre annually in positive soil enrichment will increase the crop yield by two bushels of corn each year—or by equivalent amounts of other crops grown in the rotation—and will maintain this increase for at least a dozen years on the average land now under cultivation in the United States; and no other safe investment can be named that will pay so great returns. Of course, the cost is \$1 a bushel for the first year's increase, and even the second year the four bushels of corn cost \$2; but what is the cost per bushel of the increase the tenth year? It is ten cents; and the twelfth year the twenty-four bushels of increase cost only eight and one-third cents a bushel, with a return of nearly 500 per cent on the annual investment in soil improvement.

And this is not based on mere theoretical considerations. The average corn belt land is producing only forty bushels of corn to the acre; while a six-year average yield of ninety bushels has been produced on the common corn belt land with proper and profitable soil treatment. It is too much for any farmer to adopt a definite system based upon established practical scientific information which makes it possible for his yield to increase from forty bushels to an average of sixty-four bushels an acre?

On his 500-acre farm near Gilman, in the heart of the Illinois corn belt, Mr. Frank I. Mann has produced a seventy-bushel average yield of corn for a five-year period, and with 200 acres of land in corn annually. It cost him only \$1 an acre a year in fine-ground natural rock phosphate to produce increased yields of sixteen bushels more corn, twenty-three bushels more oats and one ton more clover than the average yields secured without adding phosphorus.

But this progressive, practical farmer is only putting into profitable practice the results of the long-continued careful investigation with

raw phosphate conducted by such public service institutions as the agricultural experiment stations of Pennsylvania, Maryland, Rhode Island, Massachusetts, Ohio and Illinois. He knows that on four different fields of typical corn belt land in McLean County, Illinois, the total crop values per acre for a period of ten years were \$148.75, \$151.30, \$149.43 and \$149.96, respectively, and that on four other adjoining or intervening fields, which differed only by two liberal additions of phosphorus during the ten years, the respective crop values for the same time were \$229.37, \$221.30, \$229.20 and \$225.57.

Of course, Mr. Mann does not buy nitrogen, but he takes it from the inexhaustible supply in the air by means of clover and alfalfa or other legumes. He does not buy potassium because he knows how to liberate it from the inexhaustible supply contained in the soil, and because he knows that in the Illinois investigation just cited the crop values from four different fields not receiving potassium were \$148.75, \$151.30, \$229.37 and \$221.30; while four other adjoining fields, which differed only by liberal applications of potassium, produced during the same ten years \$149.43, \$149.96, \$229.20 and \$225.57, respectively.

Thus, as a general average, phosphorus increased the crop values by \$76.50 an acre, which amounts to more than 300 per cent on the investment, and at the end of the ten years the soil on the best treated and highest yielding land was 10 per cent richer in phosphorus than at the beginning; while the crops from the unfertilized land removed an amount of phosphorus equal to nearly one-tenth of the total supply in the plowed soil. But a similar general average shows that potassium produced increased crop values worth 86 cents—4 per cent of its cost.

What other results should be expected from land containing in the plowed soil of an acre less than 1200 pounds of phosphorus and more than 36,000 pounds of potassium?

If there is one agricultural fact that needs to be impressed upon the American people it is that the farmers of this country have been living, not upon the interest from their investments, but upon their principal; and whatever measure of apparent prosperity they have had has been taken from their capital stock. The boastful statement sometimes made, that the American landowner has become a scientific farmer, is as erroneous as it is optimistic. Such statements are based upon a few selected examples or rare illustrations, and not upon adequate knowledge of general farm practice. Even to this date almost every effort put forth by the mass of American farmers has resulted in decreasing the fertility of the soil.

The productive power of normal land in humid climates depends almost wholly upon the power of the soil to feed the crop; but the

American farmer does everything except to restore to the soil the plant food required to maintain permanently its crop-producing power. Thus, tile drainage adds nothing to the soil out of which crops are made, but only permits the removal of more fertility in the larger crops produced on the well-drained land. More thorough tillage with our improved implements of cultivation is merely "working the land for all that's in it." The use of better seed produces larger crops, but only at the expense of the soil. Even the farm manure is so limited and is spread so thinly with manure spreaders made for the purpose that it adds but little to the soil in comparison with the crops removed and soil in grain and hay as well as in meat and milk. Clover, as commonly produced and harvested, adds little or no nitrogen to the soil.

The ordinary high-priced, manufactured, acidulated, so-called "complete" commercial fertilizers, in the small amounts that farmers can afford to use, and do use quite generally in the older states, serve in part as soil stimulants and commonly leave the land poorer and poorer year by year; and if the farmers of the great corn and wheat belts are ever to adopt systems of permanent agriculture, it must be done in the near future, or they will awake to find their lands impoverished beyond self-redemption.—*C. G. Hopkins in The Country Gentleman.*

FARMERS AND GOOD ROADS.

A discussion in the Middle Tennessee Farmers' Institute yesterday gave evidence that the live agriculturists of this section of the State are very much awake to the necessity for good roads. It is a gratifying indication. Good roads are greatly needed in Tennessee, and the farmers can get them if they set about it with the right sort of determination.

Good roads more than anything else improve the value of lands. That has been demonstrated repeatedly in sections where good roads have been substituted for bad ones, and it is a logical result, because thereby the lands are made accessible and their products put within reach of market.

Good roads and good schools will do more to build up farming sections than any other agencies. They do much to banish the inconveniences of country life that have driven many people to the cities, and to make life on the farm desirable.

Every county in Tennessee should have a system of macadamized or graveled roads connecting the farming sections with the nearest shipping points. Every county can have them with the proper enterprise and effort. They will well repay any outlay of public funds.

It is gratifying that the Farmers' Institute manifests an interest in this important subject. A thorough awakening of all the farmers to the necessities and possibilities of good roads will be sure to bring them.—*Nashville Banner.*

SHEEP AS SOIL IMPROVERS.

It is universally accepted that sheep droppings under like conditions contain a larger amount of fertility than that from either the horse, cow or hog. One of the desirable features of this product is the uniform distribution made by the sheep over the land. In the leading European countries, such as England, Scotland, France and Germany, the value of sheep in improving impoverished or naturally thin soils has been recognized for centuries. It is stated on good authority that many of the soils would be almost worthless but for the fact that they are densely covered with sheep. In these countries flocks of sheep aggregating two or three thousand in number are not uncommonly seen. The various breeds which naturally inhabit the rough mountain lands, and the precipitous cliffs of these countries, where only scanty and coarse herbage exists, manifest their great value in making otherwise worthless land bring in profitable returns.

Much of the gullied land and waste hillsides of this country could be utilized profitably in the production of sheep. Many prominent farmers have proved this to their highest satisfaction. Much of the land which now grows reeds and other coarse vegetation can be restored to profitable tillage by the use of sheep. Fortunately the sheep is a ruminating animal and with the compound stomach can make use of much of the coarse grass and weeds which thrive on these depleted soils.

In European countries where sheep raising is carried on extensively and usually profitably, little concentrated feed is used, except through the flushing and lambing season. During other periods hay, grass and roots form their mainstay. Any farmer who is willing to give to sheep the same amount of intelligent care that he gives to other live stock will find them not only profitable, but good soil improvers, bringing into cultivation large areas of otherwise waste land.

MAKING LIME-SULPHUR WASH.

(By F. L. Washburn, Entomologist, University Farm, St. Paul, Minn.)

A concentrated lime-sulphur wash for use as a dormant spray may be made by diluting one gallon of concentrated lime-sulphur with ten gallons of water. The concentrated lime-sulphur is put on the market by many insecticide firms, or may be made at home in accordance with the following formula: Sulphur, 80 pounds; best stone lime, 40 pounds; water, 50 gallons.

AVERAGE PERIOD OF INCUBATION.

Chickens	20-22 days	Guinea fowls	28 days
Geese	28-34 days	Pheasants	25 days
Ducks	28 days	Ostriches	40-42 days
Turkeys	27-29 days	Pigeons	18 days
Canary birds	14 days		

CROP REPORT FOR MARCH.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., April 1, 1914.**

The Department of Agriculture received reports from 81 of the 96 counties of the State on crop conditions and prospects for the month of March. These reports indicate a good crop year for the State.

In practically all sections reporting wheat is said to be in excellent condition.

Reports also indicate that there will be a large first crop of Irish potatoes. Preparations for gardening are well advanced.

Late winter prevented the budding of fruit trees, and present prospects are for one of the best fruit crops Tennessee has ever had.

Live stock on the farms is reported in good condition with the exception of hog cholera in the various sections of the State.

Spring plowing was reported well advanced. Fine weather conditions during last fall enabled the farmers to turn land for this year's crop.

Following is the summary, for comparison, of crop conditions for March for the years 1913 and 1914:

	Per cent 1913	Per cent 1914
Wheat, condition	85	87
Garden, condition	80	77
Grasses, condition	86	82
Early Irish Potatoes, acreage, estimated	89	81
Live Stock, condition	89	89
Proportion of spring plowing done .....	..	74

DISTRICT AND COUNTY

	Wheat condition	Garden condition	Grasses condition	Early Irish Potatoes acreage est'd	Live Stock condition	Proportion of Spring Plow- ing done
A—Mississippi River Section:						
Lake .....	...	85	90	100	80	25
Obion	95	90	90	100	95	40
Dyer	90	...	...	...	100	...
Lauderdale	80	...	100	100	100	100
Tipton	100	90	85	100	95	100
Shelby .....	...	80	95	95	100	55

CROP REPORT FOR MARCH.—Continued.

DISTRICT AND COUNTY	Wheat condition	Garden condition	Grasses condition	Early Irish Potatoes acreage est'd	Live Stock condition	Proportion of Spring Flow- ing done
B—Upland Section of West Tennessee:						
Weakley	90	85	85	100	85	35
Gibson	80	85	85	100	95	100
Crockett	95	45	75	100	90	35
Madison	65	...	85	...	80	100
Haywood .....	...	90	95	...	75	...
Hardeman	55	100	90	100	90	75
Fayette	90	90	85	55	90	60
Henry	95	60	75	100	85	30
Carroll	80	95	80	100	85	20
Henderson .....	...	...	...	...	...	...
Chester	85	95	95	100	95	100
McNairy .....	...	35	65	75	70	80
Benton .....	...	...	...	...	...	...
Decatur .....	...	60	55	100	80	75
Hardin	75	70	50	50	85	25
C—Western Section of Middle Tennessee:						
Perry	90	85	90	90	95	55
Humphreys	65	55	60	85	80	50
Houston	85	65	75	90	95	25
Stewart	85	85	90	95	85	65
Montgomery	85	90	90	25	80	20
Robertson	100	75	80	...	75	...
Cheatham	90	...	80	...	85	50
Dickson .....	...	...	...	...	...	...
Hickman	75	65	70	60	90	60
Lewis	90	...	65	...	90	85
Wayne .....	...	...	...	...	...	...
Lawrence	75	80	100	100	100	25
D—Central Section of Middle Tennessee:						
Sumner	90	80	80	85	90	95
Trousdale .....	...	...	...	...	...	...
Davidson	75	...	50	70	95	90
Wilson	95	40	65	100	80	90
Williamson	90	50	50	90	85	80
Rutherford	90	75	80	40	70	90
Cannon	90	...	85	...	90	95
Maury	90	80	85	70	95	90
Marshall	85	85	85	70	85	85
Bedford	90	...	70	100	100	80
Giles	100	50	80	40	80	90
Lincoln	95	80	70	...	80	80
Moore	90	...	65	...	75	85
E—Eastern Section of Middle Tennessee:						
Macon	90	...	80	...	80	100
Clay	90	95	90	85	...	100
Pickett .....	...	...	...	...	...	...
Overton	85	80	80	85	80	65
Jackson	90	85	90	75	75	85
Smith	100	...	50	...	100	75

CROP REPORT FOR MARCH.—Continued.

DISTRICT AND COUNTY	Wheat condition	Garden condition	Grasses condition	Early Irish Potatoes acreage es't'd	Live Stock condition	Proportion of Spring Plow- ing done
E—Eas'ern Section of Middle Tennessee:						
Putnam	90	70	80	60	95	95
DeKalb	85	75	90	80	90	80
White	80	75	75	80	90	50
Warren	85	....	....	75	95	60
Coffee	85	....	....	....	....	....
Grundy	85	100	75	100	90	70
Franklin .....	....	....	....	....	....	....
F—Cumberland Plateau:						
Scott .....	....	....	....	....	....	....
Fentress .....	....	....	....	....	....	....
Morgan	95	85	85	100	90	70
Cumberland	90	80	80	....	90	50
Van Buren	85	50	65	....	85	90
Campbell	90	90	90	80	85	70
Bledsoe	90	....	95	....	85	75
Sequatchie	75	....	90	100	85	40
Marion .....	....	....	....	....	....	....
G—Central Section of East Tennessee:						
Claiborne .....	....	....	....	....	....	....
Hancock	100	95	90	100	90	75
Anderson	100	100	90	100	100	90
Grainger	95	90	75	60	85	80
Union	90	85	90	....	90	100
Knox .....	....	....	....	....	....	....
Rhea	80	....	90	....	80	75
Roane	100	100	90	100	100	75
Loudon	75	....	90	75	100	75
McMinn	85	....	80	....	80	90
Meigs	90	90	95	....	95	75
Bradley	90	80	75	100	75	80
Hamilton	75	50	75	100	75	75
James .....	....	....	....	....	....	....
H—Mountain Section of East Tennessee:						
Johnson	80	50	75	....	95	45
Sullivan	85	....	80	80	85	100
Carter	100	90	95	90	90	80
Hawkins	85	50	95	15	100	95
Washington	100	100	100	90	90	100
Unicoi .....	....	....	....	....	....	....
Greene	95	....	90	....	90	95
Hamblen	95	90	90	85	85	90
Jefferson	90	....	80	80	90	95
Cocke	95	30	95	95	95	90
Sevier	85	65	90	35	95	95
Blount	95	95	85	90	90
Monroe	85	80	90	90	95	85
Polk	90	75	100	60	100	90
	87	77	82	81	89	74

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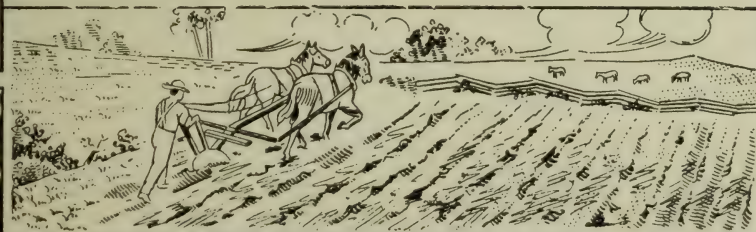
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MAY 1, 1914

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IN THIS ISSUE:

TABULATED FIELD SEED TESTS.

Bulletin No. 2.



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Department of Agriculture.

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TENNESSEE BULLETIN

TABULATED
FIELD SEED TESTS

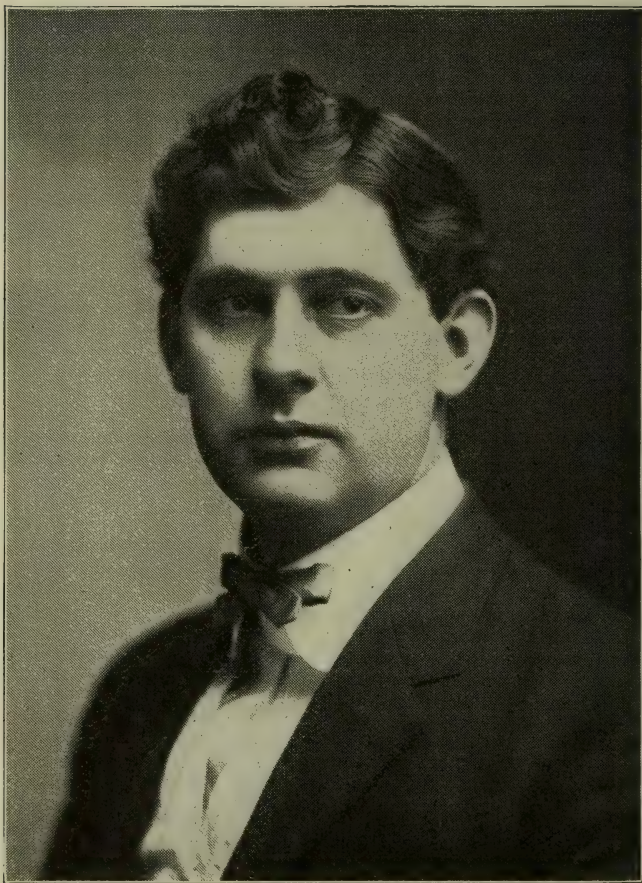
From Samples Drawn in Ac-
cordance with the Law, by the
Department of Agriculture

From January 1, 1914, to May 1, 1914

T. F. PECK, Commissioner

COMPILED BY
A. L. GARRISON, Chief Seed Inspector
AND
J. W. SAMPLE, State Chemist

This Bulletin Furnished Free Upon Application to this Department.



A. L. GARRISON
CHIEF SEED INSPECTOR

TENNESSEE SEED BULLETIN**No. 2.**

Since the publication of our last bulletin on seed selection, March 1, 1912, a great deal of work has been done. The influence of the seed control law has been felt more through educational than legal channels. Yet it must be admitted that the direct effect must apply to the strictness with which the law is enforced. Purchasers may apply the act themselves, and it is incumbent upon the farmers and retail dealers to do this if they wish to secure the full protection which it affords.

Inspectors visit the dealers through the county, and, so far as they can, inspect all the seed that is being offered. But it is impossible for them to see every individual lot that is sold. Oftentimes the sale or shipment is made direct to the farmers, and the seed is, therefore, never exposed where inspection can be made. The duty of the field inspectors is to see that all seed offered for sale is properly tagged and stamped in compliance with the law.

The guarantee tag is the farmer's recourse in case the seed prove of low germinating power or happen to be polluted with noxious weed seed.

EVOLUTION OF THE SEED BUSINESS.

The commerce in agricultural seeds has been completely revolutionized during the last half century, largely through the evolution of improved transportation and rapid communication facilities. Fifty years ago a seedsman was understood to be an expert horticulturist. Now the great bulk of the commerce is directed by business men who have neither the time nor the inclination to study field and garden crops. Formerly the seedsman enjoyed the personal acquaintance and confidence of his customers; the elaborate seed catalogues of today and large distributing seed centers were unknown. His supplies were of comparatively few sorts. With the exception of field root and garden vegetables, most of them were grown under his own supervision, and farmers and gardeners looked to him for advice in the selection of their stocks.

Now the farmer buys grass seed from New Zealand, clover from South America and England, alfalfa from Russia and different parts of the United States, mangels from Denmark and Germany, carrots from France and Holland, and other garden and field seeds from many different countries. Under previous conditions, farmers ran little risk of buying noxious weed seed or low vitality. The seedsman grew most

of his stocks, or had personal knowledge of their origin and of their purity and general quality. As he became less of a grower and more of a business man, collecting seed from widely scattered sources, the danger to the farmer increased. As the trade attained international proportions, the introduction of new and harmful weeds was inevitable; where strict measures were not taken to restrict the evil, the damage has been heavy and widespread.

PREVENTING SPREAD OF WEEDS.

With the wide development of the seed trade, the necessity of preventing as much as possible the introduction and spread of weeds was apparent; but in most countries it was not attempted until much damage had been done. Germany took the lead in establishing seed testing and control stations, nearly fifty years ago. Largely as a result of the work done at these stations, the retail markets of Germany became gradually closed to inferior seeds, while the demand for stock of superior quality from other countries increased, as did the exports of inferior seeds. With Germany taking the cream of the supply from Europe and exporting her low grade seed, other countries were ultimately compelled in self-defense to devise similar systems of seed control for the protection of agriculture.

The writer has had the opportunity and privilege to speak to many thousand farmers during the past three years, and never on any occasion has he failed to stress the fact that seed selection pays larger returns for the time devoted than any other work connected with the crop.

THE GUARANTEE TAG.

As has been stated, the Tennessee seed law provides that the guarantee tag shall state plainly the kind of seed, or the name of the seed. Now that looks like a very easy duty, and it seems that no dealer would object or avoid complying with this provision, but let us take for example seed oats. We order from our dealer fifty bushels of winter turf oats. The dealer has on hand good-looking oats. The fifty bushels are shipped, paid for and sown. Future developments prove that they were spring oats, and not only was the price, but also all the labor, completely lost. Complaint is made to the dealer. He claims forthwith that he sold the seed as oats to be fed as feedstuff or to be used as the farmer saw fit. Had the farmer demanded, before he accepted the shipment, that the guarantee be given, this talk would not go, because, the proof could be produced in the form of the guarantee tag.

While we are on this oat proposition, there is another feature that

should not be overlooked. Oats are often injured by frost, especially when grown in the North and Canada. While of excellent feeding value, such oats are often unfit for seed, and in consequence crop failure frequently results from sowing frosted seed. There is very little accurate information regarding the degree necessary to damage oats for seed purposes. So far as observations have been made, two degrees of frost in the milk stage are sufficient in most cases to ruin oats for seed. A curious feature is that often oats that have been frosted in the milk stage seem to fill all right and give seed of a heavy bushel weight. Such oats frequently refuse to germinate more than 25 per cent, and in consequence are worthless for seed.

The seed dealers and brokers who pretend to handle seed oats should guarantee the germinating power of all seed sold the farmers, as beyond doubt upon the farmers' prosperity depends their own.

SEED RYE.

As has been stated, seed rye loses largely of its vitality after one year. For this reason no farmer should take a chance of sowing rye seed that will not germinate. In the seed laboratory this year we propose to germinate free for the farmers of the State any number of samples of seed rye and winter oats. In order to do this in time for fall sowing, the seed should be bought by sample in July, August or early September. This sample should be sent to the Department of Agriculture. A germination test will be made and report submitted in time for fall sowing. If the samples begin to come in by July 1, we will be able to test at least one thousand samples.

PROBLEM OF PROPER SEED SELECTION.

Of the many problems that confront the progressive farmer of today, none is more worthy of consideration than that of proper seed selection, and it is feared that in many instances this important point receives only secondary consideration.

Just as we find many farmers making the mistake of buying low-grade fertilizers, because they cost less money, so we find an equal number buying the seed that can be had for the least cost, and in both cases it is the farmer himself who suffers and loses money.

When the farmers realize that some other consideration than the price must be the guiding factor in buying, and that the lowest-priced seed are not the cheapest, but that the purest seed are the cheapest in the end, then will we see a marked improvement in the seed conditions in the State. If the farmer will demand the purest seed and will have no other, the dealers will be compelled to meet this demand.

The initial cost of the low-grade seed may be less, but when harvest time comes around, a little figuring will show that the supposed cheap seed was not near the bargain that it appeared to be in the spring. The two main requisites of a good seed are purity and high germination, and when a seed shows up well in these two factors, it is reasonable to suppose that such seed will give a good stand if planted under the proper conditions.

PURITY.

By purity is meant as high as possible a percentage of pure seed, and freedom from other kinds of seed, dirt, sticks, chaff, etc.

The various seeds on the Tennessee markets this year show, upon examination, a very wide range in purity, running from as low as 40 per cent to 99 per cent pure seed.

Now, suppose that the seed of 40 per cent purity could be bought for one-half of what the seed of 99 per cent purity would cost, does it look like economy to buy the low-grade seed, even at that price? It certainly would not be economy, for if two bushels of the low-grade seed were sown on the same area as one bushel of the high-grade seed, you would still fall 19 per cent short of having the same number of pure seed on the plot where the low-grade seed were used.

But this is not by any means the only objection to the use of low-grade seed. The difference of 60 per cent between 40 per cent and the total of 100 per cent is made up largely of objectionable weed seed, which unfortunately, as a rule, have a high germinating factor. These weed seed will probably germinate at the same time, or before the agricultural seed, and as they are in the majority, it is more than probable that they will choke out the few good seed, and the farmer will find himself with a fine crop of weeds where he expected a crop of clover, red top or timothy. The example given above is an exceptional case, and such very low-grade seed are not at all common. But the work done this year shows a very large number of the seeds on the market to contain excessive amounts of foreign seeds, and while these foreign seeds may not to such a great extent injure the crop during its growth, they will certainly have a very decided effect upon the quality of the grain or seed produced, lowering the market value of the grain in direct proportion to the amount of foreign seed it contains. It should also be borne in mind that weeds have the ability of consum-

ing the plant food of the soil, in some cases more rapidly than the valuable plants, thus robbing the growing plants of what they would otherwise get.

The bad effects of the use of impure seed may be summed up under the following heads:

1. A poor stand, due to the limited number of good seed in a given amount.
2. Choking out or retarding the growth of the crop.
3. Consumption of plant food, thereby depriving the crop of the food necessary to its growth.
4. Lowering the grade, and consequently the market value of the crop.
5. Rendering the seed from such a crop absolutely unfit to be used as seed for planting.

GERMINATION.

After having satisfied ourselves as to the purity of a seed, we still have no definite evidence that the seed is all that it should be. It is possible to find a seed absolutely free from foreign seed which for some reason will not give a stand even when planted in liberal amounts. Such a condition is termed low germinating power, and means that for some cause the seed will not germinate, or sprout. This condition may be attributed to the seed being sterile, or unfertile, caused by improper mixture of pollen during growth. It may also be due to age of the seed, as some species of seed lose their germinating power after they reach a certain age. For example, rye that shows a high germination the first year is liable to show up very deficient if sown the second or third year after being harvested.

Bad handling and improper storage are other factors that affect the germination of seed, and should be guarded against.

After we have determined the purity and germination factors of a seed to be what they should, we still have another question to consider, and this is whether or not the seed is adapted to our climate. This can be determined by inquiry into where the seed was grown; if the climate where the seed was grown is similar to our climate, then we can reasonably presume that it should thrive here.

The pure seed law requires that each package of seed containing one pound or more offered for sale in Tennessee shall be accompanied by a plainly printed statement certifying:

1. Name of seed.
2. Full name and address of seedsman, dealer or agent.

3. A statement of the purity of the seed contained, specifying the kind and percentage of impurities.

4. Locality where seed was grown and when grown.

Time spent by the farmer in the examination of these statements on seed packages will be well spent, and may prevent his making a mistake in the selection of his seed. The farmer should bear in mind the fact that these statements cannot always be relied upon, and where he has any reason to believe that a seed is not all that is claimed for it, he should secure a sample of that seed and have it tested before he buys.

The Department of Agriculture now maintains a well equipped laboratory for making tests of this kind, and any samples of seed sent in by the farmers of the State will be examined and reported upon free of any charge.

WEED SEED.

The weed seeds of most frequent occurrence in the different agricultural seeds examined are given below, the one most frequently found being listed first, and so on in order of their occurrence:

Alfalfa—Buckhorn, sweet clover, yellow trefoil.

Alsike—Yellow trefoil, sour dock, curled dock, oxeye daisy.

Blue Grass—White cockle, lady's thumb, chickweed.

Crimson Clover—Curled dock, black mustard.

Red Clover—Buckhorn, curled dock, sour dock, field dodder.

Lespedeza—Crab grass, ragweed, barren brome grass.

Orchard Grass—Velvet grass, curled dock, sour dock, oxeye daisy.

Red Top—Five finger, yellow daisy, white cockle.

Timothy—Five finger, curled dock, lady's thumb, white cockle.

Weed seeds and dirt are not the only impurities found in the samples examined. The majority of these samples were found to contain varying amounts of other agricultural seeds. This is especially true in the case of red top samples, some of which contained as much as 30 per cent of timothy.

The market price of red top is about five times that of timothy, and if a dealer should mix in 30 per cent of the latter and sell the mixture at the regular red top price, it can be readily seen that he is making quite a nice profit. But is the farmer who buys such seed getting a square deal?

STANDARDS OF PURITY.

The following standards of germination and purity are required by law:

<i>Name of Seeds.</i>	<i>Percent of Purity.</i>	<i>Percent of Germinable Seed.</i>
Alfalfa (<i>Medicago sativa</i>).....	96	80
Barley	98	90
Blue grass, Canadian (<i>Poa compressa</i>).....	90	45
Blue grass, Kentucky (<i>Poa pratensis</i>).....	80	45
Brome, awnless (<i>Bromus inermis</i>).....	90	75
Clover, alsike (<i>Trifolium hybridum</i>).....	90	75
Buckwheat	96	90
Clover, crimson (<i>Trifolium incarnatum</i>)...	98	85
Clover, red (<i>Trifolium pratense</i>).....	92	80
Clover, white (<i>Trifolium repens</i>).....	90	75
Corn, field (<i>Zea mays</i>).....	99	94
Corn, sweet	99	75
Fescue, meadow (<i>Festuca pratensis</i>).....	95	85
Flax (<i>Linum usitatissimum</i>).....	96	89
Millet, common (<i>Setaria Italica</i>).....	90	85
Millet, pearl (<i>Pennisetum typhoideum</i>).....	99	65
Millet, hog (<i>Panicum miliaceum</i>).....	90	85
Oats (<i>Avena sativa</i>).....	98	90
Oat grass, tall (<i>Arsnenatherum avenaceum</i>)..	72	70
Orchard grass (<i>Dactylis glomerata</i>).....	70	70
Rape (<i>Brassica rapa</i>).....	99	90
Red top (<i>Agrotis alba</i>).....	90	70
Rye (<i>Secale cereale</i>).....	98	90
Rye grass, perennial (<i>Lolium perenne</i>).....	96	90
Rye grass, Italian (<i>Lolium Italicum</i>).....	95	80
Sorghum (<i>Andrepogon sorghum</i>).....	96	80
Sorghum, for fodder.....	96	60
Timothy (<i>Phleum pratense</i>).....	96	85
Wheat (<i>Triticum</i>)	98	90

Following are the results of tests made on samples gathered by the Department:

RESULTS OF FIELD SEED TESTS MADE BY THE DEPARTMENT OF AGRICULTURE.

Name and Address of Dealer from Whom Sample Was Secured	Test Number	Inspector's Number	Inspector's Name	Name of Seed	Amount Used in Test	Per Cent Pure Seed	Per Cent Foreign Seed	Inert Matter	Weed Seed Found	Number Seed Used	Per Cent Germination
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	1	1	Wynn	Orchard Grass	2 gr. 95.46	2.41	2.13		Velvet Grass	200	55.
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	2	2	Wynn	Orchard Grass	2 gr. 92.61	4.75	2.64		Velvet Grass	200	57.
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	3	3	Wynn	Timothy	2 gr. 97.50	.56	1.94		Red Top	200	86.50
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	4	4	Wynn	Red Top	2 gr. 88.60	1.90	9.50		Timothy	200	74.50
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	5	5	Wynn	Red Clover	2 gr. 97.87	1.71	.42		Crab Grass	200	37.
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	6	6	Wynn	Red Clover	2 gr. 95.70	3.00	1.30		White Cockle	200	37.
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	7	7	Wynn	Crimson Clover	5 gr. 91.26	5.24	3.50		Timothy	200	79.
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	8	8	Wynn	Alfalfa	5 gr. 97.48	.96	1.56		Red Top	200	85.50
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	9	9	Wynn	Alfalfa	5 gr. 97.74	2.12	.14		Beggar Tick	200	94.
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	10	10	Wynn	Alsike	3 gr. 94.80	3.81	1.39		Corn Cockle	200	50
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	11	11	Wynn	Rape	5 gr. 99.48	.20	.32		Curled Dock	200	72.

Hackney, Broyles & Lackey Co. Knoxville, Tenn.	12	12 Wynn	Millet	5 gr.	98.76	.44	.80	Foxtail 4 seed 400 86. Crab Grass 11 seed Ragweed 4 seed
Hackney, Broyles & Lackey Co. Knoxville, Tenn.	13	13 Wynn	Sweet Clover, White Blossom .....	.....	96.16	.95	2.89	Bar seed 10 seed Millet 3 seed Timothy 1 seed Red Top 26 seed White Cockle 4 seed Curled Dock 1 seed Clover Dodder 1 seed Chickweed 3 seed Other species 3 seed Noxious weed seed 5 seed Orchard Grass 20 seed 200 58.50 Other species 2 seed English Rye Grass 6 seed 200 74.50 Alfalfa 1 seed White Sweet Clover 1 seed Alsike 24 seed 200 82.50 Red Top 4 seed Blue Grass 2 seed Other species 17 seed Timothy 15.20% 200 83.50 Dock 2 seed Crab Grass 3 seed Yellow Foxtail 4 seed Yellow Trefoil 2 seed Other species 30 seed Buckhorn 1 seed 200 79.50 Curled Dock 2 seed Yellow Trefoil 7 seed Alsike 28 seed Other species 20 seed Red Top 45 seed 200 Velvet Grass 3.30% Other species 21 seed Night Flowering Catch Fly 1 seed Red Top 6 seed 200 Alsike 10 seed White Clover 4 seed Other species 7 seed Noxious weed seed 1 seed Timothy 75 seed 200 83.00 Smooth Dock 1 seed Night Flowering Catch Fly 1 seed Noxious weed seed 1 seed
C. W. Henderson & Co. Knoxville, Tenn.	15	15 Wynn	Oat Grass	5 gr.	97.55	1.00	1.45	
C. W. Henderson & Co. Knoxville, Tenn.	16	16 Wynn	English Blue Grass	3 gr.	97.47	1.39	1.14	
C. W. Henderson & Co. Knoxville, Tenn.	17	17 Wynn	Timothy	2 gr.	98.25	1.51	.24	
C. W. Henderson & Co. Knoxville, Tenn.	18	18 Wynn	Red Top	1 gr.	72.04	17.42	10.54	
C. W. Henderson & Co. Knoxville, Tenn.	19	19 Wynn	Red Clover	5 gr.	98.22	1.16	.62	
C. W. Henderson & Co. Knoxville, Tenn.	20	20 Wynn	Orchard Grass	2 gr.	83.72	5.61	10.67	
C. R. Baird & Co. Chattanooga, Tenn.	21	21 Wynn	Timothy	2 gr.	98.20	.80	1.00	
C. R. Baird & Co. Chattanooga, Tenn.	22	22 Wynn	Red Clover	2 gr.	95.90	3.59	.51	

RESULTS OF FIELD SEED TESTS MADE BY THE DEPARTMENT OF AGRICULTURE—Continued.

Name and Address of Dealer from Whom Sample Was Secured	Test Number	Inspector's Number	Inspector's Name	Name of Seed	Amount Used in Test	Per Cent Pure Seed	Per Cent Foreign Seed	Inert Matter	Weed Seed Found	Number Seed Used	Per Cent Germination
C. R. Baird & Co. Chattanooga, Tenn.	23	23	Wynn	Red Top	1 gr.	90.50	1.99	7.51	Timothy 7 seed Blue Grass 70 seed Millet 2 seed Other species 3 seed Red Top 24 seed Millet 1 seed Alsike 7 seed White Sweet Clover 4 seed White Cockle 2 seed Blue Grass 7 seed Five Finger 13 seed Other species 3 seed Buckhorn 24 seed Timothy 2 seed Alsike 4 seed Millet 1 seed Other species 15 seed Five Finger 6.83% Timothy 2.12%	200	78.
C. R. Baird & Co. Chattanooga, Tenn.	24	24	Wynn	Timothy	2 gr.	98.75	.63	.62	Timothy 110 seed Blue Grass 20 seed Curled Dock 4 seed Bracted Plantain 2 seed Chickweed 1 seed Oat 1 seed Alsike 1 seed Other species 13 seed Noxious weed seed 1 seed Red Clover 3 seed Alsike 12 seed Red Top 2 seed Other species 15 seed Millet 2 seed Five Finger 6 seed Other species 13 seed	200	84.50
Chattanooga Feed Co. Chattanooga, Tenn.	25	25	Wynn	Red Clover	3 gr.	98.01	1.52	.47	Timothy 110 seed Blue Grass 20 seed Curled Dock 4 seed Bracted Plantain 2 seed Chickweed 1 seed Oat 1 seed Alsike 1 seed Other species 13 seed Noxious weed seed 1 seed Red Clover 3 seed Alsike 12 seed Red Top 2 seed Other species 15 seed Millet 2 seed Five Finger 6 seed Other species 13 seed	100	84.
Chattanooga Feed Co. Chattanooga, Tenn.	26	26	Wynn	Red Top	1 gr.	80.34	10.13	9.53	Timothy 110 seed Blue Grass 20 seed Curled Dock 4 seed Bracted Plantain 2 seed Chickweed 1 seed Oat 1 seed Alsike 1 seed Other species 13 seed Noxious weed seed 1 seed Red Clover 3 seed Alsike 12 seed Red Top 2 seed Other species 15 seed Millet 2 seed Five Finger 6 seed Other species 13 seed	200	76.50
Chattanooga Feed Co. Chattanooga, Tenn.	27	27	Wynn	Orchard Grass	2 gr.	90.10	2.13	7.77	Timothy 110 seed Blue Grass 20 seed Curled Dock 4 seed Bracted Plantain 2 seed Chickweed 1 seed Oat 1 seed Alsike 1 seed Other species 13 seed Noxious weed seed 1 seed Red Clover 3 seed Alsike 12 seed Red Top 2 seed Other species 15 seed Millet 2 seed Five Finger 6 seed Other species 13 seed	200	84.50
Dan C. Wheeler & Co. Chattanooga, Tenn.	28	28	Wynn	Timothy	2 gr.	99.25	.62	.13	Timothy 110 seed Blue Grass 20 seed Curled Dock 4 seed Bracted Plantain 2 seed Chickweed 1 seed Oat 1 seed Alsike 1 seed Other species 13 seed Noxious weed seed 1 seed Red Clover 3 seed Alsike 12 seed Red Top 2 seed Other species 15 seed Millet 2 seed Five Finger 6 seed Other species 13 seed	200	91.00
Dan C. Wheeler & Co. Chattanooga, Tenn.	29	29	Wynn	Red Clover	3 gr.	93.13	1.14	5.73	Timothy 110 seed Blue Grass 20 seed Curled Dock 4 seed Bracted Plantain 2 seed Chickweed 1 seed Oat 1 seed Alsike 1 seed Other species 13 seed Noxious weed seed 1 seed Red Clover 3 seed Alsike 12 seed Red Top 2 seed Other species 15 seed Millet 2 seed Five Finger 6 seed Other species 13 seed	200	86.

30	30	Wynn	Ky. Blue Grass	1 gr. 91.30	1.19	7.51	White Cockle	6 seed	.....
							Millet	.....	.....
							Orchard Grass	1 seed	.....
							Timothy	61 seed	.....
							Other species	1 seed	.....
31	31	Wynn	Orchard Grass	2 gr. 95.80	1.01	3.19	Blue Grass	64 seed	.....
							Curled Dock	17 seed	.....
							Buckhorn	2 seed	.....
							Timothy	1 seed	.....
							Other species	32 seed	.....
32	32	Wynn	Red Top	1 gr. 92.	.63	6.47	Timothy	14 seed	200 70.50
							Five Finger	25 seed	.....
							Other species	40 seed	.....
33	33	Wynn	Alsike	3 gr. 98.06	1.73	.21	Timothy	54 seed	200 84.
							Red Clover	10 seed	.....
							Yellow Trefoil	3 seed	.....
							Chickweed	22 seed	.....
							Other species	.....	.....
							Noxious weed seed	1 seed	.....
34	34	Wynn	Red Clover	5 gr. 94.98	2.65	2.37	Field Dodder	10 seed	200 92.
							Buckhorn	54 seed	.....
							Curled Dock	3 seed	.....
							Red Top	2 seed	.....
							Timothy	2 seed	.....
							Alsike	2 seed	.....
							Other species	92 seed	.....
							Noxious weed seed	10 seed	.....
35	1	White	Timothy	2 gr. 98.46	1.22	.32	Red Top	21 seed	200 91.50
							Blue Grass	8 seed	.....
							Red Clover	5 seed	.....
							Alsike	16 seed	.....
							Other species	30 seed	.....
36	2	White	Orchard Grass	2 gr. 95.22	1.80	3.98	Buckhorn	1 seed	200 78.
							Curled Dock	1 seed	.....
							Italian Rye Grass	1 seed	.....
							Other species	46 seed	.....
37	3	White	Blue Grass	1 gr. 88.50	.30	11.20	White Cockle	7 seed	.....
							Timothy	4 seed	.....
							Other species	27 seed	.....
							Alsike	54 seed	200 82.50
38	4	White	Red Clover	5 gr. 97.73	1.73	.49	Timothy	21 seed	.....
							Night Flowering Catch Fly	1 seed	.....
							Other species	27 seed	.....
							Noxious weed seed	1 seed	.....
							White Cockle	3 seed	.....
							Alsike	1 seed	.....
39	5	White	Blue Grass	1 gr. 91.40	.22	8.38	Red Top	7 seed	.....
							Other species	27 seed	.....

RESULTS OF FIELD SEED TESTS MADE BY THE DEPARTMENT OF AGRICULTURE—Continued.

Name and Address of Dealer from Whom Sample Was Secured	Test Number	Inspector's Number	Inspector's Name	Name of Seed	Amount Used in Test	Pure Seed Per Cent	Foreign Seed Per Cent	Inert Matter Per Cent	Weed Seed Found	Number Seed Used	Per Cent Germination	
L. H. Hitchcock & Sons Nashville, Tenn.	40	6	White	Timothy	2 gr.	97.80	.25	1.25	Red Top Blue Grass Alsike Red Clover Other species Buckhorn Alsike Other species Foxtail Curled Dock Timothy Other species Timothy Daisy Five Finger Alsike Other species Timothy Five Finger White Cockle Other species Buckhorn Alsike Other Species Crab Grass Ragweed Other species Alsike Buckhorn Timothy Red Top Curled Dock Other species Five Finger Timothy Daisy Other species	14 seed 15 seed 11 seed 2 seed 33 seed 11 seed 1 seed 28 seed 1 seed 2 seed 12 seed 8 seed 24 seed 21 seed 1 seed 28 seed 28 05% 1 seed 5.03% 1 seed 29 seed 2 seed 15 seed 15 seed 87 seed 6 seed 98 seed 25 seed 13 seed 4 seed 1 seed 3 seed 31 seed 7.55% 191 seed 18 seed 21 seed	200	90.50
L. H. Hitchcock & Sons Nashville, Tenn.	41	7	White	Red Clover	5 gr.	98.69	.29	1.02		200	86.50	
McKay, Reece & Co. Nashville, Tenn.	42	1	Stout	Red Clover	5 gr.	99.10	.64	.26		200	92.	
McKay, Reece & Co. Nashville, Tenn.	43	2	Stout	Red Top	1 gr.	81.75	10.73	7.52		200	78.	
Chas. McCullough Cincinnati, Ohio.	44	3	Stout	Red Top	1 gr.	40.04	34.96	25.		200	.....
E. G. Haguewood Rutherford, Tenn.	45	4	Stout	Red Clover	5 gr.	98.53	1.02	.45		200	84.50	
J. J. Adams Humboldt, Tenn.	46	5	Stout	Lespedeza	2 gr.	90.05	6.60	3.25		.....	.....
Louisville Seed Co. Louisville, Ky.	47	6	Stout	Red Clover	5 gr.	98.58	1.20	.22		200	93.	
Chas. McCullough Cincinnati, Ohio.	48	7	Stout	Red Top	1 gr.	80.20	9.84	9.96		200	80.50	

49	8	Stout	Red Top	1 gr. 83.	4.37	12.03	Timothy Five Finger Daisy White Cockle Other species Field Dodder Buckhorn Curled Dock Noxious weed seed Buckhorn Red Top Field Dodder Alsike Other species Noxious weed seed Red Top Curled Dock Other species Buckhorn Other species Crab Grass Barren Brome Grass Ragweed Red Clover Other species Curled Dock Buckhorn Field Dodder Alsike Other species Noxious weed seed Sour Dock Velvet Grass Blue Grass Other species Noxious weed seed Daisy Five Finger Other species Red Top Red Clover Alsike Barren Brome Grass Crabgrass Peggar Tick Ragweed Other species	254 seed 33 seed 17 seed 1 seed 1 seed 37 seed 2 seed 1 seed 1 seed 17 seed 70 seed 2 seed 25 seed 1 seed 2 seed 35 seed 2 seed 2 seed 3 seed 4 seed 11 seed 31 seed 6 seed 4 seed 16 seed 1 seed 6 seed 4 seed 24 seed 6 seed 1 seed 10 seed 4 seed 39 seed 1 seed 23 seed 2 seed 2 seed 13 seed 1 seed 1 seed 1 seed 9 seed 49 seed 1 seed 2 seed 67 seed
50	9	Stout	Red Clover	5 gr. 99.45	.14	.41		
52	11	Stout	Red Clover	5 gr. 96.86	.96	2.16		
53	12	Stout	Red Clover	1 gr. 99.50	.24	.25		
54	13	Stout	Red Clover, home grown	5 gr. 99.24	.31	.45		
55	14	Stout	Lespedeza	2 gr. 93.95	3.75	2.30		
56	15	Stout	Red Clover	5 gr. 97.78	.84	1.48		
57	16	Stout	Orchard Grass	1 gr. 91.10	2.05	6.85		
58	17	Stout	Red Top	1 gr. 91.90	1.72	6.38		
59	18	Stout	Timothy	2 gr. 99.25	.44	.31		
60	19	Stout	Lespedeza	2 gr. 84.	9.50	6.50		

RESULTS OF FIELD SEED TESTS MADE BY THE DEPARTMENT OF AGRICULTURE—Continued.

Name and Address of Dealer from Whom Sample Was Secured	Test Number	Inspector's Number	Inspector's Name	Name of Seed	Amount Used In Test	Per Cent Pure Seed	Per Cent Foreign Seed	Per Cent Inert Matter	Weed Seed Found	Number Seed Used	Per Cent Germination
Otto Schwill & Co. Memphis, Tenn.	61	20	Stout	Red Clover	5 gr.	99.11	.60	.29	buckhorn 2 seed Alfalfa 7 seed Alsike 2 seed Curler Dock 8 seed Other species 2 seed Black Mustard 2 seed Red Clover 3 seed Alsike 2 seed Timothy 52 seed Other species 4 seed Orchard Grass 2 seed Foxtail 2 seed Other species 19 seed White Cockle 1 seed Timothy 2 % Red Clover 9 seed White Cockle 6 seed Other species 3 seed Sour Dock 51 seed Curler Dock 1 seed Buckhorn 6 seed Red Clover 9 seed Alsike 6 seed Chickweed 10 seed Other species 2 seed Noxious weed seed 61 seed Oxeye Daisy 17 seed Millet 3 seed Other species 17 seed Noxious weed seed 17 seed Crabgrass 5 seed Ragweed 1 seed Barren Brome Grass 56 seed Other species 1 seed Buckhorn 3 seed Red Clover 2 seed Alsike 2 seed Other species 2 seed	.....	.....
Otto Schwill & Co. Memphis, Tenn.	62	21	Stout	Crimson Clover	5 gr.	94.50	2.45	3.05			.....
Otto Schwill & Co. Memphis, Tenn.	63	22	Stout	Millet	5 gr.	98.30	.34	1.36			.....
Otto Schwill & Co. Memphis, Tenn.	64	23	Stout	Dwarf Rape	5 gr.	98.88	.54	.58			.....
Otto Schwill & Co. Memphis, Tenn.	65	24	Stout	Alsike	3 gr.	97.06	2.39	.55			.....
Otto Schwill & Co. Memphis, Tenn.	66	25	Stout	White Clover	3 gr.	96.96	1.78	1.26			.....
National Seed Co. Louisville, Ky.	67	26	Stout	Orchard Grass	1 gr.	80.94	.42	18.64			.....
Otto Schwill & Co. Memphis, Tenn.	68	27	Stout	Lespedeza	2 gr.	90.80	5.55	3.65			.....
Otto Schwill & Co. Memphis, Tenn.	69	28	Stout	Alfalfa	5 gr.	97.30	.53	2.17			.....

71	30	Stout	Timothy	2 gr. 95.95	2.20	1.85	Alsike Red Top Blue Grass Curled Dock Red Clover Other species Timothy Red Top Red Clover Millet Blue Grass Canada Thistle Sour Dock Other species Noxious weed seed Oxeye Daisy Buckhorn Blue Grass Red Clover Timothy Noxious weed seed	11 seed 89 seed 25 seed 1 seed 1 seed 145 seed 3 seed 8 seed 1 seed 7 seed 1 seed 24 seed 39 seed 25 seed 1 seed 2 seed 11 seed 1 seed 4 seed 1 seed
72	31	Stout	Alsike	3 gr. 93.36	3.34	3.30		
73	32	Stout	Orchard Grass	1 gr. 84.86	.60	14.52		
74	33	Stout	White Sweet Clover	3 gr. 96.50	.....	3.50		
75	34	Stout	Vetch	10 gr. 97.28	.....	2.72	Broken seed	
76	35	Stout	Crimson Clover	5 gr. 97.91	.69	1.40	Black Mustard Other species	1 seed 12 seed
77	36	Stout	Alfalfa	5 gr. 97.14	.46	2.40	Buckhorn Millet Red Clover Alsike Other species Buckhorn Bur Clover	1 seed 3 seed 4 seed 2 seed 1 seed 38 seed 6 seed
78	37	Stout	Red Clover	5 gr. 92.73	4.13	3.14	Alsike Curled Dock Timothy Field Dodder Black Mustard Foxtail Night Flowering Catch Fly Other species Noxious weed seed Crabgrass Ragweed Barren Brome Grass Other species Red Top	40 seed 10 seed 14 seed 24 seed 1 seed 5 seed 1 seed 87 seed 25 seed 9 seed 2 seed 31 seed 39 seed 11 seed
79	38	Stout	Lespedeza	2 gr. 89.65	3.20	7.15		
80	39	Stout	Blue Grass	1 gr. 92.40	1.38	6.22		

RESULTS OF FIELD SEED TESTS MADE BY THE DEPARTMENT OF AGRICULTURE—Continued.

Name and Address of Dealer from Whom Sample Was Secured	Test Number	Inspector's Number	Inspector's Name	Name of Seed	Amount Used in Test	Pure Seed Per Cent	Foreign Seed Per Cent	Inert Matter Per Cent	Weed Seed Found	Number Seed Used	Per Cent Germination
Tucker Mosby Seed Co. Memphis, Tenn.	81	40	Stout	Timothy	2 gr.	96.95	1.99	1.05	Blue Grass 40 seed Red Top 130 seed Alsike 20 seed Red Clover 2 seed White Cockle 1 seed Other species 14 seed	.....	.....
Tucker Mosby Seed Co. Memphis, Tenn.	82	41	Stout	Rape	5 gr.	97.80	.....	2.20	Timothy 4.81% Other species 42 seed Orchard grass 6 seed Other species 1 seed Alfalfa 1 seed White Sweet Clover 7 seed Other species 5 seed Sour Dock 18 seed Alfalfa 13 seed Timothy 40 seed Red Clover 2 seed Oxeye Daisy 2 seed Other species 7 seed Noxious weed seed 2 seed Red Top 1 seed	.....	.....
Tucker Mosby Seed Co. Memphis, Tenn.	83	42	Stout	Red Top	1 gr.	79.40	6.18	14.42	Timothy 4.81% Other species 42 seed Orchard grass 6 seed Other species 1 seed Alfalfa 1 seed White Sweet Clover 7 seed Other species 5 seed Sour Dock 18 seed Alfalfa 13 seed Timothy 40 seed Red Clover 2 seed Oxeye Daisy 2 seed Other species 7 seed Noxious weed seed 2 seed Red Top 1 seed	.....	.....
R. B. Buchanan Memphis, Tenn.	84	43	Stout	Oat Grass	2 gr.	98.72	.63	.65	Timothy 4.81% Other species 42 seed Orchard grass 6 seed Other species 1 seed Alfalfa 1 seed White Sweet Clover 7 seed Other species 5 seed Sour Dock 18 seed Alfalfa 13 seed Timothy 40 seed Red Clover 2 seed Oxeye Daisy 2 seed Other species 7 seed Noxious weed seed 2 seed Red Top 1 seed	.....	.....
R. B. Buchanan Memphis, Tenn.	85	44	Stout	Meadow Fescue	3 gr.	93.75	.75	.50	Timothy 4.81% Other species 42 seed Orchard grass 6 seed Other species 1 seed Alfalfa 1 seed White Sweet Clover 7 seed Other species 5 seed Sour Dock 18 seed Alfalfa 13 seed Timothy 40 seed Red Clover 2 seed Oxeye Daisy 2 seed Other species 7 seed Noxious weed seed 2 seed Red Top 1 seed	.....	.....
R. B. Buchanan Memphis, Tenn.	86	45	Stout	Alsike	3 gr.	97.13	2.04	.33	Timothy 4.81% Other species 42 seed Orchard grass 6 seed Other species 1 seed Alfalfa 1 seed White Sweet Clover 7 seed Other species 5 seed Sour Dock 18 seed Alfalfa 13 seed Timothy 40 seed Red Clover 2 seed Oxeye Daisy 2 seed Other species 7 seed Noxious weed seed 2 seed Red Top 1 seed	.....	.....
R. B. Buchanan Memphis, Tenn.	87	46	Stout	Millet	5 gr.	98.94	.....	1.06	Timothy 4.81% Other species 42 seed Orchard grass 6 seed Other species 1 seed Alfalfa 1 seed White Sweet Clover 7 seed Other species 5 seed Sour Dock 18 seed Alfalfa 13 seed Timothy 40 seed Red Clover 2 seed Oxeye Daisy 2 seed Other species 7 seed Noxious weed seed 2 seed Red Top 1 seed	.....	.....
R. B. Buchanan Memphis, Tenn.	88	47	Stout	Red Clover	5 gr.	96.41	1.55	2.04	Timothy 4.81% Other species 42 seed Orchard grass 6 seed Other species 1 seed Alfalfa 1 seed White Sweet Clover 7 seed Other species 5 seed Sour Dock 18 seed Alfalfa 13 seed Timothy 40 seed Red Clover 2 seed Oxeye Daisy 2 seed Other species 7 seed Noxious weed seed 2 seed Red Top 1 seed	.....	.....
Ross Seed Co. Louisville, Ky.	89	48	Stout	Red Clover	5 gr.	98.20	.56	1.24	Timothy 4.81% Other species 42 seed Orchard grass 6 seed Other species 1 seed Alfalfa 1 seed White Sweet Clover 7 seed Other species 5 seed Sour Dock 18 seed Alfalfa 13 seed Timothy 40 seed Red Clover 2 seed Oxeye Daisy 2 seed Other species 7 seed Noxious weed seed 2 seed Red Top 1 seed	.....	.....
Louisville Seed Co. Louisville, Ky.	90	49	Stout	Alfalfa	5 gr.	99.26	.06	.68	Timothy 4.81% Other species 42 seed Orchard grass 6 seed Other species 1 seed Alfalfa 1 seed White Sweet Clover 7 seed Other species 5 seed Sour Dock 18 seed Alfalfa 13 seed Timothy 40 seed Red Clover 2 seed Oxeye Daisy 2 seed Other species 7 seed Noxious weed seed 2 seed Red Top 1 seed	.....	.....

West Tenn. Whol. Grocery Co., Martin, Tenn.	91	50 Stout	Red Clover	5 gr	96.27	2.35	1.38	Black Mustard Timothy Buckhorn Sour Dock Curled Dock Millet Alsiike Night Flowering Catch Fly Bur Clover Field Dodder Other species Noxious weed seed Crabgrass Ragweed Red Clover Orchard Grass Other species Crab Grass Barren Brome Grass Ragweed Other species Timothy Alsiike Other species Red Clover Blue Grass Other species Crabgrass Ragweed Barren Brome Grass Other species Red Top Blue Grass Alsiike Red Clover Other species	1 seed 32 seed 5 seed 4 seed 6 seed 16 seed 35 seed 32 seed 4 seed 5 seed 17 seed 9 seed 44 seed 3 seed 2 seed 1 seed 23 seed 162 seed 26 seed 3 seed 53 seed 118 seed 64 seed 14 seed 5 seed 2 seed 2 seed 5 seed 7 seed 2 seed 32 seed 45 seed 2 seed 4 seed 1 seed 2 seed
J. N. Brasfield Dresden, Tenn.	93	52 Stout	Lespedeza	2 gr	86.35	6.90	6.75	Red Top Curled Dock Other species	15 seed 1 seed 12 seed
Wood & Priestley Martin, Tenn.	94	53 Stout	Lespedeza	2 gr	86.48	6.22	7.30	Red Top Red Clover Other species	12 seed 1 seed 17 seed
Louisville Seed Co. Louisville, Ky.	96	55 Stout	Red Clover	5 gr	95.47	1.86	2.67	Red Top Red Clover Other species	12 seed 1 seed 17 seed
Hardin, Hamilton & Lewman Louisville, Ky.	97	56 Stout	Timothy	2 gr	99.52	.08	.40	Red Top Red Clover Other species	15 seed 1 seed 12 seed
Holmes & Barnes Baton Rouge, La.	99	58 Stout	Lespedeza	2 gr	92.17	1.78	6.05	Red Top Red Clover Other species	12 seed 1 seed 17 seed
Hardin, Hamilton & Lewman Louisville, Ky.	101	60 Stout	Timothy	2 gr	99.25	.44	.31	Red Top Red Clover Other species	12 seed 1 seed 17 seed
Cumberland Seed Co. Nashville, Tenn.	102	Gar- rison	Lespedeza	2 gr	88	.....	12	Red Top Curled Dock Other species	15 seed 1 seed 12 seed
W. R. Stoffel Hdwe. Co. Mountain City, Tenn.	103	Gar- rison	Timothy	2 gr	99.55	.21	.24	Red Top Red Clover Other species	12 seed 1 seed 17 seed
W. R. Stoffel Hdwe. Co. Mountain City, Tenn.	104	Gar- rison	Timothy	2 gr	98.85	.65	.50	Red Top Red Clover Other species	12 seed 1 seed 17 seed
W. R. Stoffel Hdwe. Co.	105	Gar- rison	Timothy	2 gr	98.85	.65	.50	Red Top Red Clover Other species	12 seed 1 seed 17 seed

RESULTS OF FIELD SEED TESTS MADE BY THE DEPARTMENT OF AGRICULTURE—Continued.

Name and Address of Dealer from Whom Sample Was Secured	Test Number	Inspector's Number	Inspector's Name	Name of Seed	Amount Used in Test	Pure Seed Per Cent	Foreign Seed Per Cent	Inert Matter Per Cent	Weed Seed Found	Number Seed Used	Per Cent Germination
Mountain City, Tenn.			rison	Timothy	2 gr.	98.55	.60	.85	Red Top 1 seed Blue Grass 2 seed Other species 15 seed	.....	.....
W. R. Stoffel Hdwe. Co.	106	..	Gar- rison	Timothy	2 gr.	98.85	.53	.62	Paisy ..... .53% Ragweed 4 seed Crabgrass 17 seed Other species 62 seed	.....	.....
L. B. Taylor Brownsville, Tenn.	107	..	Gar- rison	Lespedeza	2 gr.	93.80	3.97	2.23	Ragweed 2 seed Crabgrass 45 seed Other species 80 seed	.....	.....
Jno. T. Gillespie Brownsville, Tenn.	108	..	Gar- rison	Lespedeza	2 gr.	89.70	6.00	4.30	Ragweed 2 seed Crabgrass 45 seed Other species 80 seed	.....	.....
A. G. King Brownsville, Tenn.	109	..	Gar- rison	Lespedeza	2 gr.	93.02	3.53	3.45	Crabgrass 18 seed Timothy 1 seed Other species 64 seed	.....	.....
G. W. King Brownsville, Tenn.	110	..	Gar- rison	Lespedeza	2 gr.	78.10	16.53	5.37	Crabgrass 13.85% Ragweed 17 seed Timothy 1 seed Other species 41 seed Sour Dock 8 seed Curled Dock 1 seed Barren Brome Grass 5 seed Blue Grass 3 seed Timothy 2 seed Italian Rye Grass 2 seed Yellow Trefoil 5 seed Other species 2 seed	.....	.....
Hardin, Hamilton & Lewman... Louisville, Ky.	111	8	White	Orchard Grass	2 gr.	97.30	1.25	1.45	Noxious weed seed 8 seed White Cockle 3 seed Orchard Grass 12 seed Other species 28 seed	.....	.....
Hardin, Hamilton & Lewman... Louisville, Ky.	112	9	White	Blue Grass	1 gr.	91.66	1.50	6.84		.....	.....

National Seed Co. Louisville, Ky.	113	10	White	Alsike	3 gr.	96.63	2.61	.75	Timothy 62 seed Yellow Trefoil 31 seed Sour Dock 13 seed Red Clover 3 seed Oxeye Daisy 2 seed Other species 2 seed Noxious weed seed 15 seed Velvet Grass 9.45% Curled Dock 16 seed Sour Dock 16 seed Buckhorn 5 seed Yellow Daisy 25 seed Italian Kye Grass 15 seed Blue Grass 29 seed Other species 22 seed Noxious weed seed 16 seed Unidentified 3 seed
National Seed Co. Louisville, Ky.	114	11	White	Orchard Grass	2 gr.	82.22	13.53	4.25	Timothy 31.90% Night Flowering Catch Fly 4 seed Five Finger 48 seed Blue Grass 9 seed Chickweed 2 seed Other species 39 seed Noxious weed seed 6 seed Red Clover 2 seed Black Mustard 1 seed Other species 13 seed Millet 1 seed Alsike 1 seed Maple Leafed Goose Foot 1 seed Yellow Trefoil 30 seed Sour Dock 36 seed Alsike 86 seed Buckhorn 5 seed Black Mustard 1 seed White Cockle 2 seed Other species 2 seed Noxious weed seed 36 seed Red Clover 5 seed Alsike 8 seed Blue Grass 4 seed Red Top 3 seed Five Finger 8 seed Other species 27 seed
Anderson Hardware Co. Franklin, Tenn. National Seed Co. Louisville, Ky.	115	12	White	Millet	3 gr.	94.66	.38	4.96	Timothy 31.90% Night Flowering Catch Fly 4 seed Five Finger 48 seed Blue Grass 9 seed Chickweed 2 seed Other species 39 seed Noxious weed seed 6 seed Red Clover 2 seed Black Mustard 1 seed Other species 13 seed Millet 1 seed Alsike 1 seed Maple Leafed Goose Foot 1 seed Yellow Trefoil 30 seed Sour Dock 36 seed Alsike 86 seed Buckhorn 5 seed Black Mustard 1 seed White Cockle 2 seed Other species 2 seed Noxious weed seed 36 seed Red Clover 5 seed Alsike 8 seed Blue Grass 4 seed Red Top 3 seed Five Finger 8 seed Other species 27 seed
Collins Hardware Co. Franklin, Tenn. National Seed Co. Louisville, Ky.	116	13	White	Red Top	1 gr.	50.15	33.63	11.22	Timothy 31.90% Night Flowering Catch Fly 4 seed Five Finger 48 seed Blue Grass 9 seed Chickweed 2 seed Other species 39 seed Noxious weed seed 6 seed Red Clover 2 seed Black Mustard 1 seed Other species 13 seed Millet 1 seed Alsike 1 seed Maple Leafed Goose Foot 1 seed Yellow Trefoil 30 seed Sour Dock 36 seed Alsike 86 seed Buckhorn 5 seed Black Mustard 1 seed White Cockle 2 seed Other species 2 seed Noxious weed seed 36 seed Red Clover 5 seed Alsike 8 seed Blue Grass 4 seed Red Top 3 seed Five Finger 8 seed Other species 27 seed
National Seed Co. Louisville, Ky.	117	14	White	Crimson Clover	5 gr.	98.42	.55	1.03	Timothy 31.90% Night Flowering Catch Fly 4 seed Five Finger 48 seed Blue Grass 9 seed Chickweed 2 seed Other species 39 seed Noxious weed seed 6 seed Red Clover 2 seed Black Mustard 1 seed Other species 13 seed Millet 1 seed Alsike 1 seed Maple Leafed Goose Foot 1 seed Yellow Trefoil 30 seed Sour Dock 36 seed Alsike 86 seed Buckhorn 5 seed Black Mustard 1 seed White Cockle 2 seed Other species 2 seed Noxious weed seed 36 seed Red Clover 5 seed Alsike 8 seed Blue Grass 4 seed Red Top 3 seed Five Finger 8 seed Other species 27 seed
National Seed Co. Louisville, Ky.	118	15	White	Alfalfa	5 gr.	98.80	.09	1.11	Timothy 31.90% Night Flowering Catch Fly 4 seed Five Finger 48 seed Blue Grass 9 seed Chickweed 2 seed Other species 39 seed Noxious weed seed 6 seed Red Clover 2 seed Black Mustard 1 seed Other species 13 seed Millet 1 seed Alsike 1 seed Maple Leafed Goose Foot 1 seed Yellow Trefoil 30 seed Sour Dock 36 seed Alsike 86 seed Buckhorn 5 seed Black Mustard 1 seed White Cockle 2 seed Other species 2 seed Noxious weed seed 36 seed Red Clover 5 seed Alsike 8 seed Blue Grass 4 seed Red Top 3 seed Five Finger 8 seed Other species 27 seed
National Seed Co. Louisville, Ky.	119	16	White	White Clover	3 gr.	94.72	3.97	1.31	Timothy 31.90% Night Flowering Catch Fly 4 seed Five Finger 48 seed Blue Grass 9 seed Chickweed 2 seed Other species 39 seed Noxious weed seed 6 seed Red Clover 2 seed Black Mustard 1 seed Other species 13 seed Millet 1 seed Alsike 1 seed Maple Leafed Goose Foot 1 seed Yellow Trefoil 30 seed Sour Dock 36 seed Alsike 86 seed Buckhorn 5 seed Black Mustard 1 seed White Cockle 2 seed Other species 2 seed Noxious weed seed 36 seed Red Clover 5 seed Alsike 8 seed Blue Grass 4 seed Red Top 3 seed Five Finger 8 seed Other species 27 seed
National Seed Co. Louisville, Ky.	120	17	White	Timothy	2 gr.	95.50	3.68	.82	Timothy 31.90% Night Flowering Catch Fly 4 seed Five Finger 48 seed Blue Grass 9 seed Chickweed 2 seed Other species 39 seed Noxious weed seed 6 seed Red Clover 2 seed Black Mustard 1 seed Other species 13 seed Millet 1 seed Alsike 1 seed Maple Leafed Goose Foot 1 seed Yellow Trefoil 30 seed Sour Dock 36 seed Alsike 86 seed Buckhorn 5 seed Black Mustard 1 seed White Cockle 2 seed Other species 2 seed Noxious weed seed 36 seed Red Clover 5 seed Alsike 8 seed Blue Grass 4 seed Red Top 3 seed Five Finger 8 seed Other species 27 seed

RESULTS OF FIELD SEED TESTS MADE BY THE DEPARTMENT OF AGRICULTURE—Continued.

Name and Address of Dealer from Whom Sample Was Secured	Test Number	Inspector's Number	Inspector's Name	Name of Seed	Amount Used in Test	Per Cent Pure Seed	Foreign Seed Per Cent	Inert Matter Per Cent	Weed Seed Found	Number Seed Used	Per Cent Germination
National Seed Co. Louisville, Ky.	121	18	White	Orchard Grass	2 gr.	89.95	7.35	2.70	Sour Dock 6 seed u'led Dock 9 seed Buckhorn 3 seed Blue Grass 48 seed Velvet Grass 240 seed Italian Rye Grass 5 seed Yellow Daisy 9 seed White Cockle 1 seed Other species 23 seed Noxious weed seed 26 seed Red Clover 1 seed Aisike 1 seed Blue Grass 3 seed Other species 14 seed Lady's Thumb 6 seed Red Top 11 seed Other species 1 seed Timothy 2 seed Blue Grass 23 seed Sour Dock 5 seed Yellow Daisy 2 seed Barren Brome Grass 9 seed Other species 13 seed Noxious weed seed 5 seed Buckhorn 22 seed Aisike 23 seed Sour Dock 4 seed Timothy 1 seed Field Dodder 6 seed Other species 17 seed Noxious weed seed 10 seed Red Top 6 seed Lady's Thumb 2 seed Other species 14 seed	.....	.....
McKay, Reece & Co. Nashville, Tenn.	122	19	White	Timothy	2 gr.	99.45	.24	.31			.....
National Seed Co. Louisville, Ky.	123	20	White	Blue Grass	1 gr.	87.80	1.65	10.55			.....
National Seed Co. Louisville, Ky.	124	21	White	Alfalfa	5 gr.	99.40	.10	.50			.....
National Seed Co. Louisville, Ky.	125	22	White	Orchard Grass	1 gr.	88.14	3.32	8.54			.....
National Seed Co. Louisville, Ky.	126	23	White	Red Clover	5 gr.	97.29	1.50	1.21			.....
National Seed Co. Louisville, Ky.	128	25	White	Blue Grass	1 gr.	89.95	2.05	8.64			.....

National Seed Co. Louisville, Ky.	127	24 White Timothy	2 gr. 98.05	.95	1.00	Blue Grass 32 seed Red Top 15 seed Red Clover 3 seed Alsike 1 seed Lady's Thumb 5 seed Five Finger 2 seed Other species 6 seed Timothy 37 seed Yellow Trefoil 29 seed Sour Dock 6 seed Oxeye Daisy 1 seed Other species 4 seed Noxious weed seed 7 seed Blue Grass 58 seed Red Top 9 seed Daisy 9 seed Curled Dock 3 seed Sour Dock 5 seed Alsike 3 seed Buckhorn 2 seed Wild Oat 1 seed Other species 5 seed Noxious weed seed 6 seed
National Seed Co. Louisville, Ky.	129	26 White Alsike	3 gr. 96.81	2.32	.87	Alsike 18 seed Timothy 7 seed Blue Grass 1 seed White Cockle 1 seed Curled Dock 2 seed Burr Clover 1 seed Other species 19 seed Timothy 216 seed Millet 24 seed Crimson Clover 21 seed Red Clover 12 seed Sour Dock 12 seed Buckhorn 7 seed White Cockle 2 seed Alsike 1 seed Other species 19 seed Noxious weed seed 12 seed Timothy 213 seed Sour Dock 40 seed Red Top 10 seed Alfalfa 4 seed White Clover 6 seed Red Clover 8 seed Noxious weed seed 40 seed
McKay, Reece & Co. Nashville, Tenn.	130	27 White Orchard Grass	1 gr. 86.13	3.07	10.80	
McKay, Reece & Co. Nashville, Tenn.	131	28 White Red Clover	5 gr. 98.33	.93	.74	
McKay, Reece & Co. Nashville, Tenn.	132	29 White White Clover	3 gr. 93.33	4.94	1.73	
McKay, Reece & Co. Nashville, Tenn.	133	30 White Contract Alsike	3 gr. 94.63	4.51	.86	

RESULTS OF FIELD SEED TESTS MADE BY THE DEPARTMENT OF AGRICULTURE—Continued.

Name and Address of Dealer from Whom Sample Was Secured	Test Number	Inspector's Number	Inspector's Name	Name of Seed	Amount Used in Test	Per Cent Pure Seed	Per Cent Foreign Seed	Per Cent Inert Matter	Weed Seed Found			Per Cent Germination
									Number	Seed Used	Per Cent	
McKay, Reece & Co. Nashville, Tenn.	134	31	White	Saplin Clover	5 gr.	95.38	2.96	1.66	Alsike	.....	82 seed	.....
									Timothy	.....	75 seed	.....
									Sour Dock	.....	8 seed	.....
									Curled Dock	.....	3 seed	.....
									Lamb's Quarters	.....	9 seed	.....
									Millet	.....	10 seed	.....
									Buckhorn	.....	3 seed	.....
									Other species	.....	35 seed	.....
									Noxious weed seed	.....	8 seed	.....
									Red Top	.....	13 seed	.....
McKay, Reece & Co. Nashville, Tenn.	136	33	White	Timothy	2 gr.	98.16	1.16	.68	Blue Grass	.....	11 seed	.....
									Alsike	.....	18 seed	.....
									Red Clover	.....	13 seed	.....
									Other species	.....	15 seed	.....
									Buckhorn	.....	58 seed	.....
									Alfalfa	.....	6 seed	.....
									Curled Dock	.....	10 seed	.....
									Timothy	.....	9 seed	.....
									Millet	.....	37 seed	.....
									Lady's Thumb	.....	8 seed	.....
McKay, Reece & Co. Nashville, Tenn.	140	37	White	Timothy	2 gr.	98.87	.46	.67	Other species	.....	36 seed	.....
									Blue Grass	.....	25 seed	.....
									Red Top	.....	34 seed	.....
									Curled Dock	.....	2 seed	.....
									Five Finger	.....	7 seed	.....
									Lady's Thumb	.....	3 seed	.....
									Other species	.....	11 seed	.....
									Timothy	.....	74 seed	.....
									Alsike	.....	48 seed	.....
									Millet	.....	25 seed	.....
Hardin, Hamilton & Lewman .. Louisville, Ky.	141	38	White	Export Clover	5 gr.	96.89	2.01	1.10	Buckhorn	.....	6 seed	.....
									Blue Grass	.....	1 seed	.....
									Sour Dock	.....	1 seed	.....
									Red Top	.....	1 seed	.....
									Other species	.....	6 seed	.....
									Noxious weed seed	.....	1 seed	.....
									Red Clover	.....	2 seed	.....
									Other species	.....	10 seed	.....
Roberson	146	..	Mail	Alfalfa	5 gr.	96.42	.18	3.40	Alsike	.....	75 seed	.....
									Timothy	.....	82 seed	.....
									Sour Dock	.....	8 seed	.....
									Curled Dock	.....	3 seed	.....
									Lamb's Quarters	.....	9 seed	.....
									Millet	.....	10 seed	.....
									Buckhorn	.....	3 seed	.....
									Other species	.....	35 seed	.....
									Noxious weed seed	.....	8 seed	.....
									Red Top	.....	13 seed	.....



J. W. SAMPLE
STATE CHEMIST

TESTING GARDEN SEED.

Very often the cause of a crop failure can be attributed to a poor stand. No matter how good the soil, the seed, the season, or the cultivation, if there is a poor stand, the yield is decreased. A poor stand, writes S. Van Smith in *Farm News*, requires about as much time, work and expense in cultivation as a good one.

This is true in gardening as well as in other lines of crop growing.

An important factor in the cause of poor stands is poor seeds. Seed may have its vitality or germinating power impaired from a variety of causes, such as lack of maturity, improper curing, or storing under unfavorable conditions. Very often the seed has spent itself germinating before it is planted, or perhaps it is too cold.

To avoid poor stands, seeds should be tested before planting. This is a very simple operation and requires but a few minutes. There are several simple methods of testing seeds, probably most of which will answer the purpose.

One of the simplest and quickest ways is to test between blotting paper. First, count out 100 seeds of the kind to be tested, taking them just as they come, and not picking out the best looking ones. Scatter the seeds between two pieces of blotting paper from four to six inches square, and place in a common china plate, and turn another plate bottom side up over the first. If pasteboard plates can be had, they are better, especially if a large number of samples are to be tested.

In this case all the plates containing samples of seed can be stacked up, each plate being placed right side up upon the one beneath. This makes each plate a cover for the one beneath it, and holds the blotting paper down closely to the seeds, preventing too rapid drying out.

The seeds should be placed in the living room to secure a temperature favorable to germination. Care should be taken that the seeds are not kept too wet, as germination takes place more readily under barely moist conditions. Strength of such germination should be noted, for it is not enough that a seed germinate. It should germinate strongly to be a good seed. Seeds which germinate weakly in such tests may not be strong enough to make a good plant under field conditions.

If molds form quickly on the seeds they are likely to be old stock.

If 100 seeds are taken, the number that germinates can be taken as the percentage of germination. If scant, the seed should not be planted. If good, or indifferent, it may be planted, making the proper allowance germinate.

Some enterprising gardener should work up a fancy trade on All vegetables in the neighborhood of cities of 5,000 or over.

CROP REPORT FOR APRIL.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., May 1, 1914.**

On crop conditions and prospects in Tennessee for the month of April, the Department received reports from correspondents in eighty-three of the ninety-six counties of the State.

While cool weather and rains have retarded farming operations in some sections of the State, on the whole the reports indicate that the prospects for a good crop year were never better.

Cotton is being planted under very favorable conditions, with an acreage about equal to that of last year.

Wheat is reported in splendid condition in all sections, and the prospects are bright for the best yield the State has had in many years. Alfalfa and young clover and meadow grasses are also reported in good condition.

A slightly increased acreage in corn is reported, but planting has been delayed in some sections on account of cold and wet weather.

Peaches were damaged some by late frosts, but apples and grapes have better prospects.

Live stock is reported in good condition. Farmers in the State are taking advantage of the offer of the Department of Agriculture at Nashville to furnish them the Dorset-Niles Anti-Hog Cholera Serum at cost, and are waging war against hog cholera.

Following is the summary, for comparison, of the crop report of the Department for the month of April, for the years 1913 and 1914:

	1913 Per Cent.	1914 Per Cent.
Cotton, acreage	95	92
Wheat, condition	87	93
Garden, condition	84	79
Oats, acreage	85	90
Oats, condition	87	89
Young Clover, acreage	87	89
Young Clover, condition	83	88
Meadow Grasses, condition	89	92
Corn, acreage	91	93
Corn, condition	82	79
Tobacco, acreage	86	86
Apples, condition	77	84
Peaches, condition	63	59
Grapes, condition	83	87
Irish Potatoes, acreage	89	91
Tomatoes, acreage .....	..	79
Tomatoes, condition	86	85
Peanuts, acreage	89	87
Live Stock, condition	89	88
Alfalfa, acreage	84	88
Alfalfa, condition	86	96

APRIL CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT.		COUNTY.																					
		Cotton—acreage.	Wheat—condition.	Garden—condition.	Oats—acreage.	Oats—condition.	Young Clover—acreage.	Young Clover—condition.	Grasses—condition.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Apples—condition.	Peaches—condition.	Grapes—condition.	Irish Potatoes—acreage.	Tomatoes—acreage.	Tomatoes—condition.	Peanuts—acreage.	Live Stock—condition.	Alfalfa—acreage.	Alfalfa—condition.	
A	Lake	100	..	85	100	85	100	95	90	70	85	..	90	80	95	90	90	85	..	85	100	95	
	Obion	85	90	90	100	75	100	90	95	90	85	70	..	80	95	95	80	80	..	90	85	80	
	Dyer	100	85	90	100	90	90	80	90	100	90	..	25	25	75	95	90	75	..	90	95	..	
	Mississippi River Section.	100	95	90	100	100	100	100	90	95	..	100	90	90	100	95	90	80	..	90	95	..	
	Lauderdale	95	95	100	90	100	100	90	95	..	100	90	90	90	100	95	90	75	..	90	95	..	
	Tipton	95	95	60	95	85	95	85	85	100	60	..	90	90	..	95	90	..	..	95	100	100
B	Shelby	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Weakley	90	90	70	100	85	100	90	80	100	..	100	70	25	90	100	100	50	..	85	100	90	
	Gibson	95	85	90	85	90	80	90	95	100	90	..	80	75	85	95	90	85	..	95	90	95	
	Crockett	95	100	90	100	100	100	100	85	95	160	75	60	65	100	90	80	50	100	90	100	..	
	Madison	100	75	100	100	100	100	100	75	100	..	..	85	65	100	100	100	100	..	100	..	..
	Haywood	100	95	80	80	85	95	75	90	80	..	..	..	..	..	100	..	..	..	75	..	..
	Hardeman	100	95	80	90	95	80	80	85	90	80	..	70	50	75	95	80	70	..	85	..	..
	Fayette	100	90	90	95	85	100	90	95	95	80	..	70	50	75	95	80	70	..	90	..	..
	Henry	100	95	85	100	90	100	95	95	100	90	..	100	75	80	100	100	85	..	80	..	..
	Upland Section of West Tennessee.	100	90	75	100	90	100	100	90	90	90	..	90	100	100	100	100	100	..	80	..	..
	Carroll	85	75	65	100	60	85	85	90	25	..	45	..	..	..	35	100	..	90	85	..	..
	Chester	..	80	65	85	95	90	90	80	70	..	..	70	10	100	..	..	..	..	85	..	..
	McNairy	60	..	100	85	90	100	..	..	..	..	..	50	25	..	85	100	..	..	95	..	..
	Benton	80	..	100	80	95	100	100	100	90	100	..	65	..	..	..	85	80	75	100	85	..
Decatur	80	..	100	80	90	85	100	95	100	95	75	..	80	40	100	100	60	80	..	100	..		
Hardin	100	90	100	95	100	100	100	100	100	95	..	..	80	..	..	100	100	80	..	100	..	
C	Perry	..	95	85	95	85	100	90	90	100	..	..	90	50	..	90	90	..	90	90	..	..
	Humphreys	..	85	80	70	65	20	65	85	95	85	90	90	50	40	90	60	50	75	95	85	95	
	Houston	..	95	75	80	90	90	90	90	100	90	100	85	50	..	95	100	75	50	95	85	95	
	Stewart	100	95	100	100	95	100	100	100	100	90	100	95	40	..	100	..	..	95	95	..	..
	Montgomery	..	100	75	95	90	95	85	95	95	95	100	90	50	100	85	85	50	..	90	85	90	
	Robertson	100	70	100	100	100	95	95	..	..	..	..	100	70	100	100	100	..	100	..	..	..
	Cheatham	..	90	60	85	90	90	90	..	..	..	..	85	40	..	95	..	..	..	85	..	..
	Dickson	100	80	100	100	100	100	100	100	100	80	50	100	80	100	100	100	80	..	..	..	..
	Hickman	75	100	100	95	85	100	95	90	90	90	100	100	50	100	100	100	100	100	90	100	100	
	Lewis	..	90	60	100	90	90	80	90	100	60	..	90	60	80	60	..	..	..	80	..	..
	Wayne	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..
	Western Section of Middle Tennessee.	100	100	75	100	90	100	100	100	100	100	20	100
	Lawrence	100	100	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..

	90	85	70	85	85	90	85	90	90	95	85	95	90	80	75	90
Sumner	100	100	90	90	80	100	95	95	95	95	85	95	90	90	80	75
Trousdale	90	85	80	80	90	90	90	95	100	100	95	85	100	100	100	90
Davidson	90	55	100	85	100	75	75	75	100	70	100	100	100	85	85	90
Wilson	100	90	95	95	90	75	90	95	95	85	100	90	75	95	80	75
Williamson	100	95	95	90	90	95	95	95	95	90	90	90	90	95	90	95
Rutherford	100	95	95	90	90	95	100	100	100	90	90	65	90	95	90	90
Cannon	100	95	90	95	100	95	100	100	100	90	90	100	100	95	90	90
Maury	100	90	75	90	85	100	100	95	95	60	100	100	100	80	75	90
Marshall	100	90	65	95	85	90	90	95	75	90	90	100	100	90	75	90
Bedford	70	90	80	80	80	60	100	80	40	50	20	20	30	80	90	95
Giles	100	80	95	90	90	95	90	100	90	90	90	90	90	85	90	95
Lincoln	100	80	95	90	90	95	90	100	90	90	90	90	90	85	90	95
Moore	80	80	80	80	70	85	85	80	90	90	90	90	90	85	90	95
Macon	80	100	80	85	60	75	60	60	90	90	25	90	90	80	80	90
Clay	85	75	80	85	90	95	95	100	90	90	100	100	100	95	95	90
Pickett	90	90	90	75	80	75	90	90	75	90	80	80	80	75	75	90
Overtown	90	75	80	75	80	75	90	90	75	90	65	65	65	65	65	90
Jackson	100	80	85	85	100	90	85	70	60	85	40	90	90	85	85	90
Smith	95	70	85	85	90	90	95	80	90	90	60	60	60	90	80	90
Futnam	95	70	85	85	90	90	95	80	90	90	60	60	60	90	80	90
DeKalb	95	65	75	75	80	75	90	90	70	95	75	75	90	95	95	90
White	95	65	75	75	80	75	90	90	70	95	75	75	90	95	95	90
Warren	90	75	90	75	50	80	80	80	80	80	100	95	100	80	80	90
Coffee	95	85	90	95	95	85	85	90	100	100	90	90	90	85	90	90
Grundy	100	90	100	100	100	100	100	100	90	80	80	80	100	90	90	100
Franklin	90	80	90	100	80	100	100	100	90	90	100	100	90	90	100	100
Scott	90	80	90	100	80	100	100	100	90	90	100	100	90	90	100	100
Fentress	90	85	75	60	60	75	95	100	90	90	100	40	90	90	95	95
Morgan	90	85	85	95	80	95	95	90	95	95	50	50	50	100	100	95
Cumberland	90	85	85	95	80	95	85	85	85	85	50	50	50	100	100	95
Van Buren	90	85	100	90	100	85	85	85	90	90	100	100	100	90	95	95
Campbell	95	80	85	90	75	80	90	90	90	90	80	80	80	90	90	95
Blacksoe	95	80	85	90	75	80	90	90	90	90	80	80	80	90	90	95
Sequatchie	90	85	100	90	100	100	100	100	90	90	100	100	80	75	75	90
Marion	90	85	100	90	100	100	100	100	90	90	100	100	80	75	75	90

	90	85	70	85	85	90	85	90	90	95	85	95	90	80	75	90
Sumner	100	100	90	90	80	100	95	95	95	95	85	95	90	90	80	75
Trousdale	90	85	80	80	90	90	90	95	100	100	95	85	100	100	100	90
Davidson	90	55	100	85	100	75	75	75	100	70	100	100	100	85	85	90
Wilson	100	90	95	95	90	95	95	95	95	90	90	90	90	95	80	75
Williamson	100	95	95	90	90	95	100	100	100	90	90	65	90	95	90	90
Rutherford	100	95	90	95	100	95	100	100	100	90	90	100	100	95	90	90
Cannon	100	90	75	90	85	100	100	95	95	60	100	100	100	80	75	90
Maury	100	90	65	95	85	90	90	95	75	90	90	100	100	90	75	90
Marshall	100	90	80	80	80	60	100	80	40	50	20	20	30	80	90	95
Bedford	70	90	80	90	90	95	90	100	90	90	90	90	90	85	90	95
Giles	100	80	95	90	90	95	90	100	90	90	90	90	90	85	90	95
Lincoln	100	80	95	90	90	95	90	100	90	90	90	90	90	85	90	95
Moore	80	80	80	80	70	85	85	80	90	90	90	90	90	85	90	95
Macon	80	100	80	85	60	75	60	60	90	90	25	90	90	80	80	90
Clay	85	75	80	85	90	95	95	100	90	90	100	100	100	95	95	90
Pickett	90	90	90	75	80	75	90	90	75	90	80	80	80	75	75	90
Overtown	90	75	80	75	80	75	90	90	75	90	65	65	65	65	65	90
Jackson	100	80	85	85	100	90	85	70	60	85	40	90	90	85	85	90
Smith	95	70	85	85	90	90	95	80	90	90	60	60	60	90	80	90
Futnam	95	70	85	85	90	90	95	80	90	90	60	60	60	90	80	90
DeKalb	95	65	75	75	80	75	90	90	70	95	75	75	90	95	95	90
White	95	65	75	75	80	75	90	90	70	95	75	75	90	95	95	90
Warren	90	75	90	75	50	80	80	80	80	80	100	95	100	80	80	90
Coffee	95	85	90	95	95	85	85	90	100	100	90	90	90	85	90	90
Grundy	100	90	100	100	100	100	100	100	90	80	80	80	100	90	90	100
Franklin	90	80	90	100	80	100	100	100	90	90	100	100	90	90	100	100
Scott	90	80	90	100	80	100	100	100	90	90	100	100	90	90	100	100
Fentress	90	85	75	60	60	75	95	100	90	90	100	40	90	90	95	95
Morgan	90	85	85	95	80	95	95	90	95	95	50	50	50	100	100	95
Cumberland	90	85	85	95	80	95	85	85	85	85	50	50	50	100	100	95
Van Buren	90	85	100	90	100	85	85	85	90	90	100	100	100	90	95	95
Campbell	95	80	85	90	75	80	90	90	90	90	80	80	80	90	90	95
Blacksoe	95	80	85	90	75	80	90	90	90	90	80	80	80	90	90	95
Sequatchie	90	85	100	90	100	100	100	100	90	90	100	100	80	75	75	90
Marion	90	85	100	90	100	100	100	100	90	90	100	100	80	75	75	90

	90	85	70	85	85	90	85	90	90	95	85	95	90	80	75	90
Sumner	100	100	90	90	80	100	95	95	95	95	85	95	90	90	80	75
Trousdale	90	85	80	80	90	90	90	95	100	100	95	85	100	100	100	90
Davidson	90	55	100	85	100	75	75	75	100	70	100	100	100	85	85	90
Wilson	100	90	95	95	90	95	95	95	95	90	90	90	90	95	80	75
Williamson	100	95	95	90	90	95	100	100	100	90	90	65	90	95	90	90
Rutherford	100	95	90	95	100	95	100	100	100	90	90	100	100	95	90	90
Cannon	100	90	75	90	85	100	100	95	95	60	100	100	100	80	75	90
Maury	100	90	65	95	85	90	90	95	75	90	90	100	100	90	75	90
Marshall	100	90	80	80	80	60	100	80	40	50	20	20	30	80	90	95
Bedford	70	90	80	90	90	95	90	100	90	90	90	90	90	85	90	95
Giles	100	80	95	90	90	95	90	100	90	90	90	90	90	85	90	95
Lincoln	100	80	95	90	90	95	90	100	90	90	90	90	90	85	90	95
Moore	80	80	80	80	70	85	85	80	90	90	90	90	90	85	90	95
Macon	80	100	80	85	60	75	60	60	90	90	25	90	90	80	80	90
Clay	85	75	80	85	90	95	95	100	90	90	100	100	100	95	95	90
Pickett	90	90	90	75	80	75	90	90	75	90	80	80	80	75	75	90
Overtown	90	75	80	75	80	75	90	90	75	90	65	65	65	65	65	90
Jackson	100	80	85	85	100	90	85	70	60	85	40	90	90	85	85	90
Smith	95	70	85	85	90	90	95	80	90	90	60	60	60	90	80	90
Futnam	95	70	85	85	90	90	95	80	90	90	60	60	60	90	80	90
DeKalb	95	65	75	75	80	75	90	90	70	95	75	75	90	95	95	90
White	95	65	75	75	80	75	90	90	70	95	75	75	90	95	95	90
Warren	90	75	90	75	50	80	80	80	80	80	100	95	100	80	80	90
Coffee	95	85	90	95	95	85	85	90	100	100	90	90	90	85	90	90
Grundy	100	90	100	100	100	100	100	100	90	80	80	80	100	90	90	100
Franklin	90	80	90	100	80	100	100	100	90	90						

APRIL CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Cotton—acreage.	Wheat—condition.	Garden—condition.	Oats—acreage.	Oats—condition.	Young Clover—acreage.	Young Clover—condition.	Grasses—condition.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Apples—condition.	Peaches—condition.	Grapes—condition.	Irish Potatoes—acreage.	Tomatoes—acreage.	Tomatoes—condition.	Peanuts—acreage.	Live Stock—condition.	Alfalfa—acreage.	Alfalfa—condition.
G	Claiborne	100	72	95	100	90	100	90	100	95	95	75	75	60	60	90	100	100	100	100	100	100
	Hancock	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	Anderson	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	Granger	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	Union	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	Knox	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	Rhea	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	Roane	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	Loudon	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	McMinn	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	Meigs	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	Bradley	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	Hamilton	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
	James	100	95	95	100	90	90	90	100	100	100	100	95	85	100	100	100	95	100	90	100	100
H	Johnson	92	93	79	90	89	89	89	92	93	79	86	84	59	87	91	85	79	87	88	88	96
	Sullivan	95	70	95	95	95	95	95	95	100	100	80	80	75	100	100	100	100	90	95	100	90
	Cartier	100	75	100	100	90	90	90	100	100	90	90	80	100	95	100	90	100	90	100	100	90
	Hawkins	100	75	100	100	90	90	90	100	100	90	90	80	100	95	100	90	100	90	100	100	90
	Washington	100	75	100	100	90	90	90	100	90	100	90	80	100	95	100	90	100	90	100	100	90
	Unicoi	95	95	95	90	90	90	90	100	100	100	100	80	100	95	100	100	100	90	100	100	90
	Greene	95	95	95	90	90	90	90	100	100	100	100	80	100	95	100	100	100	90	100	100	90
	Hamblen	95	85	85	80	95	100	95	100	100	100	100	85	50	90	100	100	100	90	100	100	90
	Jefferson	100	95	95	95	100	100	95	100	100	100	25	75	100	100	100	100	100	90	100	100	90
	Cocke	100	65	65	90	80	90	90	100	100	60	75	85	75	80	95	90	75	90	85	95	90
	Sevier	95	95	95	90	90	90	90	95	85	100	100	100	100	100	100	100	100	100	100	100	100
	Blount	100	95	100	90	90	90	90	100	100	100	100	100	100	100	100	100	100	100	100	100	100
	Monroe	100	70	60	90	90	90	90	95	100	75	100	100	75	100	100	100	100	100	100	100	100
	Polk	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
Mountain Section of East Tennessee.		92	93	79	90	89	89	89	92	93	79	86	84	59	87	91	85	79	87	88	88	96
		92	93	79	90	89	89	89	92	93	79	86	84	59	87	91	85	79	87	88	88	96

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IN THIS ISSUE:

East Tennessee Farmers' Convention.

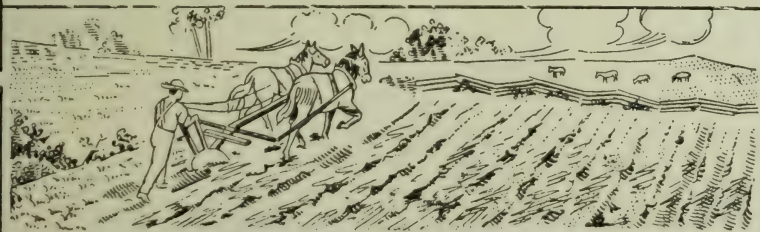
Community Cooperation.

Copartnership of the Railroads and Farmers
in Agricultural Prosperity.

Feed and Seed Laws of Tennessee.

Tennessee Fair Dates for 1914.

May Crop Report.



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EAST TENNESSEE FARMERS' CONVENTION.

Forty-first Annual Meeting at Knoxville the Most Successful in History of the Organization.

The forty-first annual meeting of the East Tennessee Farmers' Convention, held at Temple Hall, at the University of Tennessee Experiment Station, at Knoxville, on Tuesday, Wednesday and Thursday, September 19, 20 and 21, was the most successful in the history of that long-established organization.

The convention was attended by farmers from every section of East Tennessee, and many of them were accompanied by their wives and daughters. It is estimated that the attendance was more than 3,000.

Forty-one years ago the convention was organized, and it has grown steadily year by year and broadened in its scope, and during the years it has been in existence has accomplished much in its aims to promote, foster and develop a higher, a more intellectual and more effective system of agriculture. It has aroused a commendable spirit of emulation among the farmers of East Tennessee, especially in the organization of county conventions, and in this way has brought about a more thorough understanding and sympathy and spirit of cooperation in the rural communities.

For years the farmers' convention has held its meeting at the State university, and has given its cordial support to the agricultural college and the experiment station of the university. The professors of the agricultural college have appeared on the convention programs, and at every meeting the station farms have been visited by the great majority of the delegates, who have inspected and criticized the method and equipment, and have carried back to their homes many practical ideas for bettering their farms.

The railroads have been an important asset of the East Tennessee Farmers' Convention. From its inception reduced rates were provided for the annual meetings, and during the past eight years free transportation has been furnished authorized delegates from each county. The railroads fully appreciate the value to themselves of increased agricultural production, and they recognize in the high educational character of the convention's annual meetings an opportunity for the improvement of the agriculture in their territory. Aside from



J. F. Peak

all selfish motives, however, the East Tennessee farmers appreciate the helpfulness of the railroads in their enterprise, and not the least beneficial result is the good feeling which prevails throughout this section toward the transportation lines.

The sectional meetings were well attended, and the three days' program was one of the most interesting and beneficial ever offered the farmers of East Tennessee.

Canning club girls were at the convention in large numbers, in charge of Miss Virginia P. Moore, State Organizer, and Miss Margaret Ambrose, Knox County Collaborator.

The convention was called to order at 10:30 a.m. Tuesday, May 29, by President W. B. Stokely, of Dandridge, and the program that had been prepared for the three-days' meeting was given with only a few changes.

President Stokely's address dealt with the history of the organization, and the good it had accomplished, and prophesied something of the greater development of East Tennessee's agricultural resources.

On the third day of the meeting, the convention elected officers for the ensuing year, as follows:

H. M. Wilson, of Niota, McMinn County, President.

W. S. Shaw, of Roane County, Vice-President.

Prof. H. A. Morgan, of Knoxville, Secretary and Treasurer.

Capt. H. B. Clay, of Hawkins County, was elected honorary Vice-President for life.

County Vice-Presidents were elected as follows:

Anderson—H. G. Dale.

Bledsoe—W. A. Greer.

Blount—S. L. King.

Bradley—J. W. McGhee.

Campbell—W. H. Myers.

Carter—W. W. Smith.

Claiborne—J. H. Rector.

Cocke—Daniel Miller.

Grainger—Hamilton Foust.

Greene—N. P. Earnest.

Hamblen—Joe Tyler.

Hamilton—Walter Hampton.

Hancock—J. L. Leaman.

Hawkins—J. B. Hamilton.

James—Ed Roberson.

Jefferson—J. L. Chilton.

Johnson—N. R. Wills.
Knox—John A. Jones.
Loudon—E. L. Griffiths.
McMinn—O. P. Mayfield.
Marion—A. R. Rankin.
Meigs—S. J. Hornsby.
Monroe—T. C. Bayless.
Morgan—R. H. Maben.
Polk—Bert E. Biggs.
Rhea—H. L. Reynolds.
Roane—W. C. Shaw.
Scott—Miller Todd.
Sequatchie—W. P. Alley.
Sevier—C. M. McMahan.
Sullivan—S. B. Gunning.
Unicoi—C. A. Barry.
Union—Pryor S. Smith.
Washington—Phil S. Taylor.

NEW OFFICERS MEET.

Immediately after the election of new vice-presidents, they held a meeting and concurred in the action of the former vice-presidents in not changing the dates for the farmers' annual meeting. They asserted that present plants work so well they will recommend no changes, according to present opinions.

LIVE STOCK CLUB.

A club for the improvement of live stock was formed, with the following officers:

President, J. D. Hamilton, of Hawkins County.
Vice-President, J. A. Dunn, Knoxville.
Secretary-Treasurer, Prof. C. A. Willson, Knoxville.

RECOMMENDATIONS.

Recommendations along educational and industrial lines were adopted as follows by the convention, they being presented by the committee on resolutions:

"The East Tennessee Farmers' Convention and Institute, in its forty-first annual convention assembled, expresses its abiding faith and trust in God and its gratitude for the continued blessings of His providence. We have on every hand evidence of progress and prosperity. The laws of nature are being studied as never before by men. We are

seeing things in a truer light and doing things in a saner way than in the past. Prejudice against science is dying out.

"Farmers are laying aside outworn traditions and primitive methods. The unrest of progressiveness is manifest everywhere. Individualism, which begets sordid selfishness, is giving way to collective effort, which means unselfishness. We are feeling more and more the need for community of interests and concert of action. The farmer of yesterday worked too much to himself; the farmer of tomorrow will be a cooperative fraternity; the ideal state of man will more and more dominate the farming world.

"We urge upon Congress the enactment of a rural credits bill, which will enable farmers to obtain loans for the development of their farms at such rates of interest and for such periods of time as conditions warrant.

"We favor the adoption by the next legislature of Tennessee of the Torrens system of land title registration which will make possible the establishment of rural credits by state and nation, and will fix in absolute security the titles of all land holders.

"We approve heartily the development of rural delivery of mails and the parcel post, and ask that as rapidly as possible this service be extended to further meet the needs of farmers.

"We call attention to the rapid growth of farmers' insurance companies, and advise all counties not now having one to lose no time in availing themselves of the benefits which these organizations offer to those who live in the country.

"We favor the construction of a better system of public highways. Farmers can no longer remain blind to their own interests in these matters. Good roads mean everything to a country's development, and without them we cannot hope to build up permanent rural life.

"As to public schools we favor the consolidation of many of the present inefficient and poorly equipped schools of our State, believing that such consolidation will largely increase the scope and efficiency of the public school system.

"We urge the rapid introduction into the public school curriculum of courses in agriculture and domestic science. The rural school of today, in order to be vitalized, must be made to teach those branches of learning which equip the youth of the farm for efficient life upon the farm. We also urge that the various counties employ county agricultural advisers as rapidly as they can be trained for this work.

"We commend the enforcement of the pure seed, feed, and fertilizer inspection laws of Tennessee, which guarantee the quality of these commodities to the consumer.

"Believing that the hope of all future achievement in the agricultural world lies in cooperation, we declare ourselves in favor of the establishment of farmers' organizations, which will facilitate better marketing of farm products, economy in the purchase of farm supplies, and eliminate as far as possible the many useless steps which now lie between producer and consumer."

Various resolutions of appreciation to university authorities, officers of the convention, speakers, etc., were adopted.

MEMORIALS.

Memorials on the death of W. A. Templeton, of Dayton, and on that of James Balden Cate, son of John W. Cate, of Bradley County, were presented and read to the convention. They were drawn up by a committee of which Dr. George F. Mellen was chairman.

Some of the addresses and papers delivered before the convention are given in this number of Tennessee Agriculture. Others will appear in another issue.

COMMUNITY COOPERATION.

ADDRESS OF T. F. PECK, COMMISSIONER OF AGRICULTURE, BEFORE THE
EAST TENNESSEE FARMERS' CONVENTION.

Mr. President, Ladies and Gentlemen: We farmers of East Tennessee should be very grateful to the founders and those who have been active in perpetuating the East Tennessee Farmers' Convention. It has been a fountain of agricultural knowledge that farmers for the past forty years could visit annually with pleasure and profit to themselves.

The conventions have broadened in usefulness and have kept pace with, or rather have led, the movements for better agriculture in this division of the State.

The program for this convention deals with the live questions now interesting the farmers, and those who really want to do better farming will take advantage of the live discussions that will be heard during the convention. I hope the attendance will be better and more good accomplished than at former meetings.

When Professor Morgan wrote me about attending the convention and asked me to name the subject I would talk on, I replied that it would be "Community Cooperation," for I think it is a subject that we have all neglected too long. If we had given our attention to this question long ago and successfully solved that problem, the

other work we have undertaken would have been accepted with far more understanding and appreciation.

We have our experiment station, our College of Agriculture, and our demonstration agents, all doing good work. We know that the original research work is invaluable. We know that we must have men trained for advanced work in agriculture. We know that the demonstration work, the boys' corn club work, the girls' tomato club work, have accomplished wonders, and we would not minimize, but rather enlarge, all those forces.

But, my friends, there is a work that can be done that will serve as the foundation, the working base, for all the other forces and make their work more effective. That work is in establishing community cooperation, making the community the unit and blending those communities into county agricultural associations.

If we could realize that our interest, our prosperity and happiness are more dependent upon the prosperity of the community in which we live, than on all the other communities in the world put together, we would take a greater interest in matters that will make that community better and more progressive.

We all know that our communities are not as cohesive as they should be. Every farmer is trying to work alone. Each selects the breed or type of live stock that strikes his fancy. Many grow certain crops because they like to grow them, without regard to the market demands for that crop. The result is that in live stock and farm crops we have such a variety and so limited a quantity of each that we cannot attract the best buyers or secure the best prices.

Our lack of cooperation has resulted in poor schools, poor roads and unsatisfactory social conditions, making home life on the farm so uninviting that our boys and girls take advantage of the first opportunity to go where they believe they will find social conditions better and where they believe they can be more prosperous.

Are we going to drift along, and let conditions continue as they are, when the remedy is within our reach? I do not think we should. Your State Department of Agriculture is going to do all in its power to get the people of Tennessee to appreciate the importance of community cooperation.

I will tell you briefly how we are going to undertake this work. I am glad that so many communities are represented here and I hope you will get the suggestion and act on it. You know that we have three grand divisions of the State—East, Middle and West Tennessee. We have an Assistant Commissioner of Agriculture for each

division. To these commissioners has been assigned the inauguration of the work of community cooperation in their respective divisions. For East Tennessee we have Mr. J. A. Dinwiddie, of New Market, and those of you who are interested in the work can secure his cooperation in your community by communicating with him.

The hard problem with them will be to get down to the community idea of work. Our ideas are inclined to get too big on the start. We do not feel like we are accomplishing much if we fail to have large audiences, an elaborate program and things go with a flourish.

But if we succeed in establishing community cooperation on a sound, practical basis we have simply got to make up our minds to do community work. What I mean by community work is to select a community, locate its boundaries, get the names of every farmer in that community, find out who are the leaders and go to them, and



A Field of Oats in McMinn County which will average 80 bushels to the Acre.

outline the advantages to the community to be gained by working as a unit on all their problems.

Show them how it will affect them in the production and sale of live stock, of farm crops, of dairy products, fruits and vegetables. Get the leaders enthused with the benefits and advantages to be gained and get them to take the matter up with the other farmers in the community. When sufficient interest is aroused, arrange for a meeting of the farmers at the community school house or at the home of one of the farmers, and at that meeting be prepared to show them the advantages socially, educationally and financially.

Show them how, as a community, they can be their own distributors, so that instead of only 40 cents out of the dollar paid by the con-

sumer for farm products going to the farmer, and 60 cents going to the distributor, they can graft on the production end of their business distribution, and secure at least 50 per cent more for their farm products and save the consumer money.

Show them that by producing quality and quantity they can supply the dealers who say they now have to go outside of the State for more than 75 per cent of the farm products required by their trade. Get them to realize what it would mean to retain in active local circu-

We cannot work up an interest and perfect an organization and State.

We cannot work up an interest and perfect an organization and leave them to work alone, but keep in touch with them and help them get results. If we can get as much as two active community organizations perfected in each county in Tennessee in a year we will have done the State a great service, because with such a leaven it will not take long to get cohesion and cooperation in every community in the State. Then our other forces will find those farmers that have heretofore been either indifferent or antagonistic, eager to take up and put in practice their suggestions. Then agriculture in our elementary schools will be a live subject. Then the high school without provision for agriculture, both theoretical and practical demonstration work, will have to wake up. Then, too, our College of Agriculture will have more young men striving to enter its doors. Then the agricultural course will be the most popular.

In the organization of the community club, do not overlook the women and girls, because they will readily grasp its possibilities for them. They make the home attractive or otherwise, according to their opportunities. Give them encouragement and a fair chance and they will make their homes so really homelike and inviting that the men and boys will be more content to remain in them. Give the farm women a chance to make their homes what they desire, and they will do much towards solving the problem of keeping the boys and girls permanently on the farm.

If we would improve agricultural conditions, let's begin with the first essential—practical and profitable community cooperation. Then the other forces can plant their seed of agricultural knowledge in ground that is fertile and that will produce results. We can solve the question if we will get down to individual work in the community in perfecting the organization, and stay with it until it is getting profitable results.

In this work we will have the cooperation of some of the rail-

roads, and I believe all of them, when they understand the plan, and the good that will result from it, will cooperate in the work, because all of the railroads have manifested a keen, practical interest in agricultural development and have rendered the department splendid cooperation in the work we have been doing. The railroads want increased tonnage and a prosperous citizenship along their lines. They will readily see that this work is the first essential step in that direction.

Now, as for the organization, make it simple and practical. A president, vice-president and secretary will be the officers necessary to start with. For secretary select a farmer who has had business training, for in addition to keeping the records of the meetings he should keep posted as to market conditions.

The club should at least meet once a month; once a week would be better. For the club there should be farm, live stock, fruit and market papers. Make the club a social center. The community will be better if the farmers and their families will get together oftener in a social and business way. If the meetings could be held at the homes of the members in turn, the effect would be good, because in anticipation of the meeting that farmer and his family would want things looking right, and many things would be done to make that home and farm look good to the visitors that would otherwise not be done. The result would be to stimulate pride in the vocation of farming, pride in the farm, pride in the community and pride in the county.

The Tennessee State Fair is going to do its full share to encourage the movement. Next year there will be given a prize of \$800 for first, \$600 for second, \$400 for third, and \$200 for fourth prize, and four \$100 premiums in the order of merit for the best collective exhibit from county agricultural associations, and like prizes to some associations for best collective exhibits of live stock. This enables the communities to contribute to this collective exhibit, both of farm products and live stock. The winning counties will take the money back and offer it as premiums to the communities for the next year.

By community cooperation we can do so many things that we cannot do as individuals. True, we have a few farmers who have land and capital that enable them to own labor-saving machinery, to produce live stock and farm crops in quantities to attract the best buyers and get the best prices. But the average small farmer cannot do so alone, but by working together they can do it.

We have all heard the story of the farmer who, when his boys were grown and began showing a disposition to separate, called them together and produced a bundle of sticks and asked them to break the

sticks. Each boy tried in vain to break the sticks. Then the father untied the bundle and with ease broke one stick at a time. He wanted to show them that in union there is strength, and the lesson is of equal value to us today.

If the farmers of any community will perfect an organization for that community and study the problems peculiar to that community, by cooperation they can solve the local problems. Instead of several types of beef cattle, they can agree on some particular breed or type, and all produce the same, reducing the cost for service animals, producing a uniform type and quantity sufficient to insure best prices. The same will apply to all live stock.

Instead of every farmer trying to produce a crop different from his neighbor, and for which there is no market demand, and if there were, the quantity he would have would not attract buyers, it would be better for the farmers to determine the crops for which their soils are best suited and for which there is the greatest market demand, then all produce those crops, and when the crops are ready for market, prepare them attractively and build up a reputation for that community for the superior quality of its products.

Without community cooperation schools and roads grow worse instead of better, because everyone in the community depends on someone else, and the schools and roads are neglected.

We complain about our boys and girls wanting to leave the farm. The fault is ours, not theirs. We have failed to make our community what it should be. We have neglected social and educational conditions. We have been indifferent about attractive home life conditions. We have only given our children an opportunity to see the drudgery side of farm life, and they are not to blame for wanting to get away from it. We have communities in the State that are now cooperating and they are prospering, and there is no disposition there on the part of the young people to leave those communities.

We can and will have more prosperous and contented communities just as fast as they grasp the importance and value of community cooperation. If we want to be of real service to our community and State, we have the opportunity in this work. We do not have to go away from home to start it, but begin in our own home community, remembering that "great oaks from little acorns grow."

We, as farmers, cannot afford to be indifferent. Your presence here is evidence that you are not indifferent, but the percentage of progressive farmers is entirely too small.

Just a few years ago resident Tennesseans owned our timber and

mineral lands in the State. They owned the undeveloped water powers. They did not appreciate their possibilities for development and producing wealth. They did not appreciate their possibilities for development by cooperation; but capitalists from other States did, with the result that our own Tennesseans have sold their birthright for a mess of pottage. Those resources are being developed. We are furnishing them a market for their products. We are furnishing them their cheap day labor and the profits are leaving Tennessee to enrich other sections of the country.

Now some things are not pleasant to contemplate, but we had better analyze conditions, understand them, and do what we can to improve them.

While a small percentage of our farmers are wide awake and proving that they have the capacity to profit by their opportunities, we all know that too many of them are clinging to obsolete methods of farming and farm practice that every year reduces the fertility of their farms and makes it harder for them to provide the comforts and conveniences for those dependent upon them. We know they cannot continue indefinitely the hopeless struggle. Gradually they, too, will sell their birthright for a mess of pottage, and they will join the vast army of day laborers with little hope of ever becoming again independent producers.

The value of Tennessee soils and their ready response to intelligent treatment is known. Our climatic condition and splendid rainfall are also well known. Capital also knows that men trained in scientific agriculture can be secured, who can take the neglected land and the labor that will then have no choice, and rebuild those farms and make them produce bountiful crops and return good dividends for the invested capital.

The possibilities of our soils and advantages of climate and rainfall are too well known for the land to remain idle. It will be developed, but by whom? Our native Tennesseans, or by combination of outside capital where the profits will go to the money centers instead of remaining in active local circulation? It is far better for Tennessee and Tennesseans to retain the individual small farmer to till his own ground, harvest his own crop, and the profits from his labors remain in his own community, county and State, to make conditions better for all our people.

It does not matter whether we are farmers or engaged in some other vocation; if we are Tennesseans, we are vitally interested in this question of improving rural life conditions, and we can all cooperate

in getting more cohesion among the farmers. I think the first important step is individual work in encouraging community cooperation. Prepare the way for boys' corn clubs, girls' tomato clubs, demonstration and institute work, short course work by the College of Agriculture.

You are interested in your home community. It means most to you. Go back home when this institute adjourns and get ready for community cooperation so that we can save to Tennesseans their birth-right that will elude their grasp unless you help them adjust themselves to conditions confronting them and that must be intelligently met.

In conclusion, my friends, while we are making progress towards better agriculture, better roads, and better schools; while we are providing better for our physical and mental requirements; as we better understand how to use the splendid resources provided by nature for our comfort and temporal happiness, we should remember the source from which all these blessings come to us. We should endeavor to make our lives and our actions voice our gratitude to God, the Creator of all things, and the Giver of all good gifts.

We should remember that our life spent on this earth is only a probationary state for our future existence—a period allowed for growth and development—an opportunity given us for self-development. We cannot be indifferent to high moral standards of living. We not only increase our capacity for real happiness now, but we develop as we should for that future life that continues forever.

COPARTNERSHIP OF THE RAILROADS AND THE FARMERS IN AGRICULTURAL PROSPERITY.

ADDRESS OF G. A. PARK, GENERAL IMMIGRATION AND INDUSTRIAL AGENT
OF THE LOUISVILLE & NASHVILLE RAILROAD, BEFORE THE EAST
TENNESSEE FARMERS' CONVENTION AT KNOXVILLE.

The following interesting and instructive address, dealing with the relations of the railroads and the farmers, and dwelling specially on the part the railroads have done and are doing in developing agriculture, was delivered before the recent meeting of the East Tennessee Farmers' Convention at Knoxville by Hon. G. A. Park, General Immigration and Industrial Agent of the Louisville & Nashville Railroad, at Louisville, Ky. The Louisville & Nashville was one of the first railroads of the country to inaugurate a department to look after the develop-

ment of agriculture and manufacturing enterprises, mining, etc., in the large territory served by the road, and the head of this department of the Louisville & Nashville, Mr. Park, is thoroughly familiar with this work, and his address will be found interesting reading. Mr. Park's address follows:

After considering what I should say to you, I finally decided that the thing for me to do is to tell you what the railroads are doing, want to do, and their dependence upon the farmers, and with a heart to heart talk say some things that may let you see how utterly dependent we are upon you, and how earnestly and zealously we are trying to serve and cooperate with the farmer, becoming, if he will permit us, his loyal friend.

I suppose you all know what constitutes an organized railroad. Let me say that railroads are managed by individuals, and the individuals grouped into bureaus or departments having several heads, which direct and overlook several branches of the service, each service requiring trained minds and experience to bring their departments as near to perfection as possible. These several grouped departments report to a cabinet of executive officials whose training has fitted them for the office they hold, and they in turn report to a chief executive usually termed the President.

Now, Brother Farmer, permit me to say that these officials, like yourself, are human. They are as liable to err as you, and may sometimes see only their side of a question or controversy that may arise. The education of the railroad official has progressed, the same as the education of the farmer, and the efficient railroad official today freely admits that there are many, many things that he does not understand and would wish to improve upon, just as there are many things connected with agricultural life that the farmer does not understand.

After what is practically a life service connection with the railroads and a very close working arrangement, personal affiliation with and friendship for the farmers for many years, I feel that I can come to you and from the heart say things that you will grasp, and know what I say is not for bombastic effect. The subject of my address was chosen deliberately, as my long connection with the railroad has taught me that every employe, every owner of stock of the company and every creditor in the form of a bondholder is dependent upon the farmer, the farmer's success and the farmer's goodwill, without which the railroad would be marked by a "streak of rust," and the diversified interests of the cities, their manufactures and industrial plants would cease and the people would starve. While other interests would suffer and the teeming millions starve, *you would be able to produce a sustenance from the soil.* We can live without luxuries and can for a season diminish and control our wants for them, but we cannot live without the necessities and will grumble or rebel if we cannot obtain them. Do you realize your "kingship," importance and responsibility—a wonderful calling, a calling which, in my opinion, is the noblest of all callings?

It is as true as you and I are living and looking each other in the

face that the railroad cannot exist without the farmer, and I believe you are generous enough to say that the farmer would be seriously handicapped without the cooperation and reliable service of the railroad.

I do not purpose to give you any advice or suggestion as to how you should do things. Your very excellent University of Tennessee, with the Agricultural Department of the State of Tennessee working hand in hand, is, I think, not only capable but far superior, and were I to seek for reliable information, or wish advice on any subject, I should select them.

Wishing to follow their example, we have, at a great expense, established an agricultural division of our work that requires, as we feel, a trained mind and hand that not only has had scientific schooling but practical experience, meeting failures and obtaining successes, and by demonstration learned how to pursue the good and avoid the pitfalls of the bad.

The railroad with which I am connected—and I wish to say that all other railroads in the South are doing the same character of work—has a corps of trained experts who travel from state to state, county to county, and farm to farm, rendering service and giving advice based on practical experience in every branch of agriculture—live stock of all kinds, as well as the tree—be it in the forest, under cultivation for its fruit or for its adornment in parks, lawns or streets of our cities.

These experts are in sympathy with farm life and its problems. They are, of necessity, agronomists, horticulturists, entomologists, plant pathologists, botanists, chemists, agrostologists, animal husbandmen and dairy experts and other kindred sciences, as well as foresters; they also assist in the marketing problems that best serve the interest of the grower and shipper.

They use the most valuable knowledge gleaned in various fields of research, which they in person bring to the farmer in a sympathetic and practical manner.

Excerpts are made by our office force from the bulletins of the United States Department of Agriculture and the various state experiment stations and colleges, which are distributed to the farmers without cost, as well as special bulletins to cover special conditions.

This character of work requires for its success high ideals, with no selfish motives, but a united purpose for the betterment of the individual and the surrounding section—all interests and people must work harmoniously together to secure the greatest resultant good.

This is a cooperative age, and in its work of development the railroad is always eager to work with any and all forces that make for progress. We will in the future, as we have in the past, encourage, cooperate and serve in the upbuilding of the territory traversed by our rails, and with the grower plan, collaborate and advise those who permit us to do so, as by best serving the farmer we best serve the railroad.

In a painstaking and systematic way these experts are studying agricultural conditions, as they are desirous of benefiting every one whose happy privilege it is to live in the country, till the soil, work with

nature and become better acquainted with the materials and the powers they are to associate with, by finding out the nature of the soil, rendering it healthier, preparing it for tillage, plowing, sowing and harvesting crops of the greatest value without impoverishing it. The person who has thoroughly learned scientific methods will understand the reasons for the operations of agriculture, and that without practice, science and knowledge will amount to nothing, as many thousand things taught by practice have not found their way into books. Science and knowledge, like individuals, may make mistakes for the reasons that the application is not thorough enough and that one acquires the greatest success by observation and experience.

I think the poem of Ella Wheeler Wilcox describes in a very clear manner what the farmer and the railroad are to mankind as she depicts the work of human beings as divided into two classes, of only two kinds, namely, the "Lifters" and the "Leaners," the analysis of which has been found to be, to the one "Lifter" there are twenty "Leaners." There would not be found many "Leaners" among the farmers and the railroads. They lift, lift and lift, with oh, so many "Leaners" who by unjust, unfair and gross misrepresentation would pull down the very means of good which support the life of the human race.

We are hearing much nowadays about scientific farming and the scientist. As science is nothing more than knowledge, let us learn, from a supposed conversation between a farmer and a scientist, something about nature's fertilizer—manure.

Mr. Farmer—Everybody knows that manure is valuable and that its beneficent effects last four or five years. Now, I would like to know what you know about it.

Mr. Scientist—There are some things I don't understand about it. I would like to know more than I do. I find that a ton of manure has on an average ten pounds of nitrogen worth 20 cents per pound; it has two pounds of phosphorus worth about 6 cents per pound; it has eight to ten pounds of potassium worth 5 cents per pound, which brings its value to \$2.52 to \$2.62 per ton if you had to purchase it on the market. I find further that one-third to one-half is recklessly wasted by you, Mr. Farmer, and if it had no other value than the chemicals contained, it would indeed be surprising at the good it does.

Mr. Farmer—I did not know manure was worth that much. What further have you found out about it?

Mr. Scientist—While at present it is worth \$2.52 to \$2.62 per ton, it is worth a great deal more than that. It adds humus to the soil, which keeps it from washing in wet time or baking in a dry period.

Mr. Farmer—I notice my fields do not wash when manured. They are not pasty during rainy seasons. They stand drouth a great deal better. Is all of this on account of manure?

Mr. Scientist—Yes, and decidedly more than that. This humus keeps the soil particles apart, so that the crops may have better development. I have found that we could not live without bacteria; crops could not grow, and without crops we could not feed the live stock. Manure furnishes enormous numbers of bacteria.

Mr. Farmer—What further have you discovered?

Mr. Scientist—I find two kinds of bacteria. One converts the nitrogen into ammonia, which passes off into air; the other is barnyard manure, which quickly decomposes coarse material, such as cornstalks, stubble, roots, etc. It has four values. (1) Affords food for the crops to eat. (2) Makes the soil lively and healthy, putting it in good physical condition. (3) Holds moisture. (4) Eats by dissolving coarse manure, which the plant cannot use, by putting it in such a form that it can be used by the crops.

This is a concise, clear-cut way of describing what science is—nothing more, nothing less, than knowledge with common-sense application.

Desiring a citizenship of only the best to become your neighbors, who would grow up with your families and the children intermarrying become one general commingling of the whole, we have been cautious and careful to solicit only the best, and this selection has enabled us to secure a good people with which you could affiliate.

Is there, therefore, any reason why the railroad should not have your friendship, goodwill, and we should like, oh, so much your championship? The advantage of cooperation is alike to the farmer and the railroad and has been likened unto two hounds running together which will kill more rabbits than four hounds running separately.

The best farmer is not always the one who works physically harder. It is the one who learns day by day and profits through observation and by the experience of his more successful neighbor, and secures the profits and comforts he creates from his intelligent methods in his agricultural direction. He knows how to care for the soil, how to replenish it, how to protect it from erosion or washing and how to cultivate it. He likewise is a good roads champion and very much interested in the economics of the home.

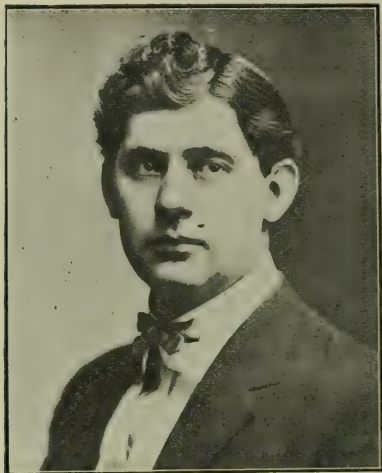
Thomas Arnold has coined an axiom which we all can profit by, viz: "Two things we ought to learn from history: one, that we are not in ourselves superior to our fathers; another, that we are shamefully inferior to them if we do not advance beyond them."

In preparing this address I found it difficult in the beginning to adapt myself to a discussion that would please me, and in closing I find it more difficult to say those things that may be pleasing and beneficial to you. I am, therefore, fearful that the beginning as well as the ending will be a disappointment to both of us.

I want to say before I close that I appreciate the compliment and the privilege of being with you and letting you know that the railroad wants the friendship of the farmer, and that with your goodwill, encouragement and cooperation the railroads could adopt more progressive measures that would, in a more tangible way, benefit all peoples and interests.

THE FEED AND SEED LAWS OF TENNESSEE.

ADDRESS OF A. L. GARRISON, CHIEF FEED, SEED AND FERTILIZER INSPECTOR,
BEFORE THE EAST TENNESSEE FARMERS' CONVENTION.

THE FEED INSPECTION LAW.

If all of the live stock were owned by the farmer, or kept on the farm, the feeding question would resolve itself into the simple proposition of the farmer raising enough feed to supply the needs of his stock, and we would have no need for the feed manufacturer and his products. But such a condition does not and never can exist. The liveryman, the transfer man, the contractor and numerous other stock owners and users, who cannot produce feedstuff of any kind, are the ones who are dependent upon the feed manufac-

turers, and are the ones who should derive the greatest benefit from the enforcement of the feed control laws.

Prior to the passage in 1907 of the feed control laws, the consumers of commercial feeding stuffs in Tennessee were at the mercy of the feed manufacturers and dealers, and had no protection whatever.

While there have always been many honest feed manufacturers and dealers who conscientiously tried to give the consumer his money's worth, there have been others who had no such scruples, and in consequence Tennessee became the dumping ground for the inferior products which could not be sold in states having feed control laws.

Before the passage of our feed control laws, such products as ground corncobs, oat hulls, chaff, ground peanut hulls, etc., were quite plentiful on Tennessee markets, being mixed in with some good feeding material and put on the market under some high-sounding trade name calculated to mislead the consumer. Where the consumer thought he was getting a concentrated feed of high nutritive value, he was in reality getting a material whose chief constituent was indigestible woody matter, or crude fibre, and which was not worth the freight as a feeding material.

When such feeds were used, and the stock began to "run down," losing their appetites and getting thin, there were other unscrupulous manufacturers—for example, the condimental stock feed men—stand-

ing ready and waiting to enrich themselves at the expense of the consumer. These people put on the market, under wonderful guarantees, mixtures of some good feedstuffs, such as linseed meal, bran, wheat and corn products, to which had been added small quantities of some cheap drugs and other foreign materials, claiming for such mixtures the most marvelous curative properties.

The agents of the manufacturers of these nostrums were ever ready to prescribe their goods as a sure cure for whatever ailment the stock might have, in many cases the same remedy being prescribed for both diarrhea and constipation. Usually all that the supposed sick animal needed was feed of proper nutritive qualities, which it was not getting, due to adulteration of the commercial feedstuff that was being fed. Fancy names were applied to these stock powders, and they commanded fancy prices, and if they would do only a small part of what is claimed for them by the manufacturers, they would be well worth the price.

Thanks to the passage of the State and National pure food and drugs act, the consumer is no longer a prey to the stock food and stock powder man, and now when he thinks his stock is in need of such materials as copperas, Epsom salts, charcoal, saltpetre, sulphur or any of the common remedies, he goes to the drug store and gets what he needs at a decent price, instead of having to pay fifty or a hundred times as much for the same material in the form of a stock powder.

Since the passage of the feed control laws in Tennessee the quality of the feedstuffs offered for sale has shown a steady improvement, each year's inspection showing a marked improvement over the preceding year, until we have now reached the point where we can safely say that Tennessee is comparatively free from adulterated feedstuffs, and the consumer as a general rule is getting his money's worth when he buys a bag of feed bearing the stamp of the Tennessee Feed Inspection. This condition could never have been attained by the unaided efforts of the Department of Agriculture, and was brought about through the cooperation of the honest dealers and the consumers working with the same end in view.

Because the 1913 feedstuffs inspection shows the conditions of the feed trade in the State to be on such a high plane is no reason why vigilance on the part of anyone should be relaxed, and it is the earnest desire of the Department of Agriculture that the dealers and consumers of the State continue to cooperate with the Department in maintaining the high standard which has been reached. And this standard cannot be maintained without such cooperation.

If anyone, be he manufacturer, dealer or consumer, finds a feed on

the Tennessee markets, which he has reason to believe is not all that is claimed for it, or which does not bear the proper tag and stamp, it is his duty to report the case to the Department of Agriculture. All such cases reported will be at once investigated, and where the law is being violated, the proper steps for the correction of the evil will be taken.

The 1913 inspection shows a few instances where the guaranteed analysis is not what it should be for a feed of the given composition. In such cases the manufacturers have been advised to change their guarantees. Errors of this character are due to ignorance on the part of the manufacturer, and to failure to have chemical analyses of his products made from time to time.

The feeding value of a feedstuff is dependent upon the amount of digestible matter that it contains. All feedstuffs contain a certain amount of indigestible matter which passes through the body of the animal without doing anything to sustain the animal. Therefore, a desirable concentrated feed is one that contains the smallest amount of indigestible and the largest amount of digestible matter. The amount of any ingredient of a feed digested by an animal depends upon the proportions of the other ingredients which are being fed along with it. Thus, if carbohydrates are fed in too large a proportion, a considerable part of them will be evacuated without nourishing the animal and be wasted.

SEED INSPECTION LAW.

Since the publication of one seed bulletin on seed selection, March 1, 1912, a great deal of work has been done. The influence of the seed control law has been felt more through educational than legal channels. Yet it must be admitted that the direct effect must apply to the strictness with which the law is enforced. Purchasers may apply the act themselves, and it is incumbent upon the farmers and retail dealers to do this if they wish to secure the full protection which it affords.

Inspectors visit the dealers through the country, and, so far as they can, inspect all the seed that is being offered. But it is impossible for them to see every individual lot that is sold. Oftentimes the sale or shipment is made direct to the farmers, and the seed is therefore never exposed where inspection can be made. The duty of the field inspectors is to see that all seed offered for sale is properly tagged and stamped in compliance with the law.

The guarantee tag is the farmer's recourse in case the seed prove of low germinating power or happen to be polluted with noxious weed seed.

The commerce in agricultural seeds has been completely revolutionized during the last half century, largely through the evolution of improved transportation and rapid communication facilities. Fifty years ago a seedsman was understood to be an expert horticulturist. Now, the great bulk of the commerce is directed by business men who have neither the time nor the inclination to study field and garden crops. Formerly the seedsman enjoyed the personal acquaintance and confidence of his customers; the elaborate seed catalogues of today and large distributing seed centers were unknown. His supplies were of comparatively few sorts. With the exception of field root and garden vegetables, most of them were grown under his own supervision and farmers and gardeners looked to him for advice in the selection of their stocks.

Now, the farmer buys grass seed from New Zealand, clover from South America and England, alfalfa from Russia and different parts



An Ear of Good Corn.

of the United States, mangels from Denmark and Germany, carrots from France and Holland, and other garden and field seeds from many different countries. Under previous conditions, farmers ran little risk of buying noxious weed seed or low vitality. The seedsman grew most of his stocks, or had personal knowledge of their origin and of their purity and general quality. As he became less of a grower and more of a business man, collecting seed from widely scattered sources, the danger to the farmer increased. As the trade attained international proportions the introduction of new and harmful weeds was inevitable; where strict measures were not taken to restrict the evil, the damage has been heavy and widespread.

With the wide development of the seed trade, the necessity of preventing as much as possible the introduction and spread of weeds was apparent, but in most countries it was not attempted until much damage had been done. Germany took the lead in establishing seed testing and control stations, nearly fifty years ago. Largely as a result of the work done at these stations, the retail markets of Germany became gradually closed to inferior seeds, while the demand for stock of superior quality

from other countries increased, as did the exports of inferior seed. With Germany taking the cream of the supply from Europe and exporting her low grade seed, other countries were ultimately compelled in self-defense to devise similar systems of seed control for the protection of agriculture.

The writer has had the opportunity and privilege to speak to many thousand farmers during the past three years, and never on any occasion has he failed to stress the fact that seed selection pays larger returns for the time devoted than any other work connected with the crop.

As has been stated, the Tennessee seed law provides that the guarantee tag shall state plainly the kind of seed, or the name of the seed. Now, that looks like a very easy duty, and it seems that no dealer would object or avoid complying with this provision, but let us take for example seed oats. We order from our dealer fifty bushels of winter turf oats. The dealer has on hand good looking oats. The fifty bushels are shipped, paid for and sown. Future developments prove that they were spring oats, and not only was the price, but also the labor, completely lost. Complaint is made to the dealer. He claims forthwith that he sold the seed as oats, to be fed as feedstuff or to be used as the farmer saw fit. Had the farmer demanded, before he accepted the shipment, that the guarantee be given, this talk would not go, because the proof could be produced in the form of the guaranteed tag.

While we are on this oat proposition there is another feature that should not be overlooked. Oats are often injured by frost, especially when grown in the North and Canada. While of excellent feeding value, such oats are often unfit for seed, and in consequence crop failure frequently results from sowing frosted seed. There is very little accurate information regarding the degree necessary to damage oats for seed purposes. So far as observations have been made, two degrees of frost in the milk stage are sufficient in most cases to ruin oats for seed. A curious feature is that often oats that have been frosted in the milk state seem to fill all right and give seed of a heavy bushel weight. Such oats frequently refuse to germinate more than 25 per cent, and in consequence are worthless for seed.

The seed dealers and brokers who pretend to handle seed oats should guarantee the germinating power of all seed sold the farmers, as beyond doubt upon the farmers' prosperity depends their own.

As has been stated, seed rye loses largely of its vitality after one year. For this reason no farmer should take a chance of sowing rye seed that will not germinate. In the seed laboratory this year we pro-

pose to germinate free for the farmers of the State any number of samples of seed rye and winter oats. In order to do this in time for fall sowing, the seed should be bought by sample in July, August or early September. This sample should be sent to the Department of Agriculture. A germination test will be made and report submitted in time for fall sowing. If the samples begin to come in by July we will be able to test at least one thousand samples. -

Of the many problems that confront the progressive farmer of to-day, none is more worthy of consideration than that of proper seed selection, and it is feared that in many instances this important point receives only secondary consideration.

Just as we find many farmers making the mistake of buying low grade fertilizers, because they cost less money, so we find an equal number buying the seed that can be had for the least cost, and in both cases it is the farmer himself who suffers and loses money.

When the farmers realize that some other consideration than the price must be the guiding factor in buying, and that the lowest priced seed are not the cheapest, but that the purest seed are cheapest in the long run, then will we see a marked improvement in the seed conditions in the State. If the farmer will demand the purest seed and will have no other, the dealers will be compelled to meet this demand.

The initial cost of the low grade seed may be less, but when the harvest time comes around a little figuring will show that the supposed cheap seed was not near the bargain that it appeared to be in the spring. The two main requisites of a good seed are purity and high germination, and when a seed shows up well in these two factors, it is reasonable to suppose that such seed will give a good stand if planted under the proper conditions.

By purity is meant as high as possible a percentage of pure seed, and freedom from other kinds of seed, dirt, sticks, chaff, etc.

The various seeds on the Tennessee market this year show, upon examination, a very wide range in purity, running from as low as 40 per cent to 99 per cent pure seed.

Now, suppose that the seed of 40 per cent purity could be bought for one-half of what the seed of 99 per cent purity would cost, does it look like economy to buy the low grade seed, even at that price? It certainly would not be economy, for if two bushels of the low grade seed were sown on the same area as one bushel of the high grade seed, you would still fall 19 per cent short of having the same number of pure seed on the plot where the low grade seed were used.

But this is not by any means the only objection to the use of low grade seed. The difference of 60 per cent between 40 per cent and

the total of 100 per cent is made up largely of objectionable weed seed, which unfortunately, as a rule, have a high germination factor. These weed seed will probably germinate at the same time, or before the agricultural seed, and as they are in the majority, it is more than probable that they will choke out the few good seed, and the farmer will find himself with a fine crop of weeds where he expected a crop of clover, red top or timothy. The example given above is an exceptional case, and such very low grade seed are not at all common. But the work done this year shows a very large number of the seed on the market to contain excessive amounts of foreign seeds, and while these foreign seed may not to such a great extent injure the crop during its growth, they will certainly have a very decided effect upon the quality of the grain or seed produced, lowering the market value of the grain in direct proportion to the amount of foreign seed it contains. It should also be borne in mind that weeds have the ability of consuming the plant food of the soil, in some cases more rapidly than the valuable plants, thus robbing the growing plants of what they would otherwise get. The bad effects of the use of impure seed may be summed up under the following heads:

1. A poor stand, due to the limited number of good seed in a given amount.
2. Choking out or retarding the growth of the crop.
3. Consumption of plant food, thereby depriving the crop of the food necessary to its growth.
4. Lowering the grade, and consequently the market value of the crop.
5. Rendering the seed from such a crop absolutely unfit to be used as seed for planting.

After having satisfied ourselves as to the purity of a seed, we still have no definite evidence that the seed is all that it should be. It is possible to find a seed absolutely free from foreign seed which for some reason will not give a stand even when planted in liberal amounts. Such a condition is termed low germinating power, and means that for some cause the seed will not germinate or sprout. This condition may be attributed to the seed being sterile, or unfertile, caused by improper mixture of pollen during growth. It may also be due to age of the seed, as some species of seed lose their germinating power after they reach a certain age. For example, rye, that shows a high germination the first year, is liable to show up very deficient if sown the second or third year after being harvested.

Bad handling and improper storage are other factors that affect the germination of seed, and should be guarded against.

After we have determined the purity and germination factors of a seed to be what they should, we still have another question to consider, and this is whether or not the seed is adapted to our climate. This can be determined by inquiry into where the seed was grown; if the climate where the seed was grown is similar to our climate, then we can reasonably presume that it should thrive here.

The pure seed law requires that each package of seed containing one pound or more, offered for sale in Tennessee, shall be accompanied by a plainly written statement certifying:

1. Name of seed.
2. Full name and address of seedsman, dealer or agent.
3. A statement of the purity of the seed contained, specifying the kind and percentage of impurities.
4. Locality where seed was grown and when grown.

Time spent by the farmer in the examination of these statements on seed packages will be well spent, and may prevent his making a mistake in the selection of his seed. The farmer should bear in mind the fact that these statements cannot always be relied upon, and where he has any reason to believe that a seed is not all that is claimed for it, he should secure a sample of that seed and have it tested before he buys.

The Department of Agriculture now maintains a well-equipped laboratory for making tests of this kind and any samples of seed sent in by the farmers of the State will be examined and reported upon free of any charge.

The weed seeds of most frequent occurrence in the different agricultural seeds examined are given below, the one most frequently found being listed first, and so on in order of their occurrence:

Alfalfa—Buckhorn, sweet clover, yellow trefoil.

Alsike—Yellow trefoil, sour dock, curled dock, oxeye daisy.

Blue grass—White cockle, lady's thumb, chickweed.

Crimson clover—Curled dock, black mustard.

Red clover—Buckhorn, curled dock, sour dock, field dodder.

Lespedeza—Crab grass, ragweed, barren brome grass.

Orchard grass—Velvet grass, curled dock, sour dock, oxeye daisy.

Red top—Five finger, yellow daisy, white cockle.

Timothy—Five finger, curled dock, lady's thumb, white cockle.

Weed seeds and dirt are not the only impurities found in the samples examined. The majority of these samples were found to contain varying amounts of other agricultural seeds. This is especially true in

the case of red top samples, some of which contained as much as 30 per cent of timothy.

The market price of red top is about five times that of timothy, and if a dealer should mix in 30 per cent of the latter and sell the mixture at the regular red top price, it can be readily seen that he is making quite a nice profit, but is the farmer who buys such seed getting a square deal?

TENNESSEE FAIR DATES FOR 1914.

POSTOFFICE	COUNTY	DATE	SECRETARY
Alexandria	DeKalb	Sept. 3-5	Rob Roy.
Carthage	Smith	Sept. 10-12	S. M. Corley.
Celina	Clay	Sept. 8-11	W. F. Brown.
Cookeville	Putnam	Aug. 27-29	A. P. Barnes.
Deer Lodge	Morgan	Sept. 22-25	T. F. Hayworth.
Dresden	Weakley	Oct. 14-17	C. B. Brasfield.
Dyersburg	Dyer	Sept. 29-Oct. 3...	F. D. Haleb.
Fayetteville	Lincoln	Aug. 26-28	F. M. Bledsoe.
Gallatin	Sumner	Aug. 27-29	W. Y. Allen.
Humboldt	Gibson	Sept. 15-18	C. W. Rooks.
Jacksboro	Anderson	Sept. 23-25	H. C. Cox.
Jackson	Madison	Oct. 5-10	W. F. Barry.
Kingston	Roane	Sept. 15-18	Sam R. Sparks.
Memphis (Tri-State) ..	Shelby	Sept. 26-Oct. 3...	F. D. Fuller.
Morristown	Hamblen	Oct. 6-8	R. F. Taylor.
Murfreesboro	Rutherford ..	Sept. 9-11	B. B. Kerr.
Nashville (State) ...	Davidson	Sept. 21-26	J. W. Russwurm
Newport	Cocke	Oct. 13-15	J. M. Jones.
Paris	Henry	Sept. 20-Oct. 3...	R. H. Hudson.
Rome	Smith	Aug. 20-22	A. T. Williams.
Selmer	McNairy	Oct. 20-23	W. K. Abernathy.
Spring City	Rhea & Meigs	Sept. 22-25	J. R. Fischeffer.
Shelbyville	Bedford	Sept. 2-4	W. E. Gant.
Sweetwater	Monroe	Sept. 29-Oct. 2...	J. F. Childress.
Union City	Obion	Sept. 9-12	J. W. Woosley.
Winchester	Franklin	Sept. 1-4	J. F. Vaughan.

CROP REPORT FOR MAY.

Crop correspondents reported to the Department of Agriculture from eighty-three of the ninety-six counties of the State on crop conditions for the crop month ending May 20. The Department is experiencing some difficulty in securing reports from correspondents in some sections of the State and is endeavoring to secure some new crop reporters. The cooperation of crop correspondents is very necessary and is earnestly requested in order that this Department may make reports monthly as to conditions in the State.

Reports received give indication of one of the best crop years the farmers of Tennessee have experienced.

Wheat is in excellent condition and about ready for the harvest and the yield will probably be much in excess of that of last year.

The acreage in corn is about the same as in 1913 and the condition of the crop is good, but is beginning to need rain in some sections of the State.

Cotton is showing a fairly good stand but is somewhat late in some sections of the cotton belt. The acreage will exceed that of last year and the prospects are for as good crop as that of 1913, which was a very large yield.

In many sections of the State pastures are suffering for want of rain and gardens also damaged on that account.

The acreage in tobacco will be in excess of that of last year, but planting has been delayed in the tobacco section on account of lack of seasonable weather.

Live stock is in good condition throughout the State. Since the establishment of the State anti-hog cholera serum plant and the campaign being waged by the Department of Agriculture against hog cholera, the condition of hogs is being gradually improved in the State, and it is hoped to soon eradicate this scourge.

Fine crops of strawberries have been harvested and marketed and the price has been good. Reports indicate a good apple and peach crop, fruit not being damaged as much as had been feared by the late frost.

Rain is needed for Irish potatoes, and with seasonable weather there will be an average production.

Below is given the summary for comparison of the report of the Department for the years 1913 and 1914:

	1913	1914
	Per Cent	Per Cent
Cotton, acreage	91	94
Cotton, condition	77	77
Wheat, condition	83	93
Garden, condition	85	87
Oats, condition	75	87
Young Clover, condition	76	85
Grasses, condition	77	85
Corn, acreage	96	93
Corn, condition	85	82
Tobacco, acreage	74	93
Tobacco, condition	78	82
Apples, condition	61	75
Peaches, condition	59	71
Grapes, condition	81	86
Irish Potatoes, acreage	93	89
Irish Potatoes, condition	84	80
Tomatoes, acreage	90	90
Tomatoes, condition	81	85
Peanuts, acreage	86	86
Live Stock, condition	90	87
Alfalfa, condition	85	89

MAY CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT.	COUNTY.												
		Cotton—acreage.	Cotton—condition.	Wheat—condition.	Garden—condition.	Oats—condition.	Young Clover—condition.	Grasses—condition.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Tobacco—condition.	Apples—condition.
A	Lake	100	85	90	90	90	100	95	90	85	95	95	Alfalfa—condition.
	Obion	95	80	95	80	90	85	90	90	90	100	85	Live Stock—condition.
	Dyer	95	100	100	85	95	90	100	100	100	90	100	85
	Laurens	100	80	100	90	100	100	100	100	100	100	100	95
	Tipton	100	70	80	85	75	80	80	100	100	100	100	90
	Shelby	95	85	100	100	100	95	100	100	100	100	100	.....
B	Weakley	95	90	90	85	85	90	90	85	90	100	90	85
	Gibson	95	90	90	95	90	90	95	100	95	100	100	95
	Crockett	100	50	90	100	100	100	100	100	100	100	100	95
	Madison	100	50	85	100	60	100	90	95	80	100	100	100
	Haywood	100	50	80	85	65	100	90	75	80	100	100	80
	Hardeman	90	75	85	90	90	75	80	100	85	100	100	90
	Payette	100	60	85	95	100	90	90	100	95	100	100	95
	Henry	100	75	95	90	85	85	85	100	90	100	100	80
	Carroll	100	60	75	90	80	90	70	100	80	100	100	75
	Henderson	100	65	85	85	80	80	80	100	80	100	100	75
	Chester	100	90	100	95	80	100	100	100	90	100	100	100
	McNairy	75	.....	80	75	65	.....	.....	85	.....	.....	.....	.....
C	Benton	80	70	85	90	100	100	100	100	80	85	85	90
	Decatur	100	75	100	100	100	80	75	100	50	100	100	95
	Hardin	100	75	100	100	100	80	75	100	50	100	100	100
	Perry	100	80	95	85	85	80	85	100	80	100	100	75
	Humphreys .....	.....	.....	70	80	70	70	75	100	70	100	100	95
	Houston .....	.....	.....	95	85	85	85	90	100	90	100	100	90
	Stewart .....	.....	.....	85	80	80	80	80	100	100	100	100	90
	Montgomery .....	.....	.....	95	80	90	80	75	75	70	100	100	80
	Robertson .....	.....	.....	100	95	90	90	90	100	100	100	100	80
	Cheatham .....	.....	.....	90	85	85	90	90	95	65	100	100	95
	Dickson .....	.....	.....	100	75	100	80	100	100	100	100	100	100
	Union .....	.....	.....	100	100	100	100	100	100	100	100	100	100
Western Section of Middle Tennessee.	Lewis	100	100	100	100	100	100	100	100	90	75	50	100
	Wayne .....	.....	.....	100	100	100	100	100	100	100	100	100	100
	Lawrence	100	90	100	100	75	75	75	75	75	75	75	90
	Lawrence	100	90	100	100	75	75	75	75	75	75	75	90

[illegible]

MAY CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Cotton—acreage.	Cotton—condition.	Wheat—condition.	Garden—condition.	Oats—condition.	Young Clover—condition.	Grasses—condition.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Tobacco—condition.	Apples—condition.	Peaches—condition.	Grapes—condition.	Irish Potatoes—acreage.	Irish Potatoes—condition.	Tomatoes—acreage.	Peanuts—acreage.	Tomatoes—condition.	Peanuts—acreage.	Live Stock—
G. Central Section of East Tennessee.	Claiborne	...	...	95	90	90	95	95	100	75	100	...	80	90	75	100	90	100	90	...	90	95
	Hancock	...	...	95	90	95	95	95	100	90	...	...	85	85	95	100	95	100	95	...	95	100
	Anderson	...	...	90	80	75	85	90	100	80	...	...	85	70	...	100	100	100	...	...	100	...
	Grainger	...	...	100	80	75	60	75	100	75	...	...	90	75	...	80	90	...	...	...	80	...
	Union	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Knox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rhea	...	...	90	85	85	80	80	90	...	...	...	75	25	...	80	70	...	...	...	...	...
	Roane	...	...	100	90	75	85	85	100	90	...	...	85	65	100	100	100	100	90	...	95	95
	Madison	...	...	100	80	100	100	80	75	75	...	...	50	50	100	100	100	50	75	...	80	...
	McMinn	...	...	80	90	80	80	75	85	85	...	...	...	80	...	90	85	75	75	...	90	...
	Meigs	...	...	95	90	85	100	95	90	90	...	...	65	40	80	90	90	95	95	...	40	...
	Bradley	...	...	80	90	80	60	75	80	80	...	...	75	100	90	100	100	80	80	...	80	...
	Hamilton	...	...	100	75	75	90	75	90	85	...	...	75	75	...	100	50	100	75	...	90	...
	James	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H Mountain Section of East Tennessee.	Johnson	...	...	90	90	80	80	80	100	80	...	...	100	90	100	100	80	...	...	...	90	...
	Sullivan	...	...	90	80	85	90	85	95	75	...	...	...	80	75	...	90	...	...	...	95	...
	Carter	...	...	95	85	90	95	90	95	95	...	...	85	80	...	95	...	...	...	...	95	...
	Hawkins	...	...	100	90	100	100	100	95	...	...	...	...	100	50	...	100	...	...	...	95	...
	Washington	...	...	100	75	100	100	75	100	90	...	...	95	50	50	100	75	100	80	...	90	...
	Unicoi	...	...	95	85	80	90	75	100	90	...	...	80	70	85	100	85	100	80	...	90	85
	Greene	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hamblen	...	...	80	95	90	90	80	100	95	...	...	75	70	95	100	85	100	80	...	90	95
	Jefferson	...	...	100	95	95	95	95	100	90	...	...	75	90	100	90	80	...	...	...	95	...
	Cocke	...	...	100	85	95	90	80	100	90	...	...	85	90	75	100	80	90	85	...	90	...
	Sevier	...	...	100	90	85	90	80	90	90	...	...	85	75	75	100	90	90	85	...	95	...
	Blount	...	...	100	90	100	100	95	100	90	...	...	...	75	100	100	90	90	85	...	90	...
	Monroe	...	...	100	90	100	90	90	100	60	...	...	80	50	100	100	75	100	60	...	100	100
	Folk	100	80	100	85	100	100	95	70	90	100	100	100	100	100	...	100	100
		94	77	93	87	87	85	85	93	82	93	82	75	71	86	89	80	90	85	85	87	89

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IN THIS ISSUE:

Description and Itinerary of Agricultural Special Train.

Twofold Value of the Honeybee.

Do Bees Injure Fruit?

Combining Beekeeping and Farming.

Report of State Inspector of Apiaries. Brood Diseases of Bees.

Some Nectar and Pollen-Bearing Plants of Tennessee.

Crop Report for June.



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JULY 1, 1914.

Department of Agriculture.

STATE OF TENNESSEE.

THOS. F. PECK, Commissioner.
T. G. SETTLE, Chief Clerk.
A. L. GARRISON, Chief Feed, Seed and Fertilizer Inspector.
DR. GEORGE R. WHITE, State Veterinarian.
J. W. SAMPLE, State Chemist.
J. A. DINWIDDIE, Assistant Commissioner for East Tennessee.
JESSE TOMLINSON, Assistant Commissioner for Middle Tennessee.
R. T. DEBERRY, Assistant Commissioner for West Tennessee.
J. W. WYNN, Feed, Seed and Fertilizer Inspector for East Tennessee.
NOBLE C. WHITE, Feed, Seed and Fertilizer Inspector for Middle Tennessee.
A. M. STOUT, Feed, Seed and Fertilizer Inspector for West Tennessee.
G. M. BENTLEY, State Entomologist and Plant Pathologist.
DR. J. S. WARD, State Inspector of Apiaries.
HOYT N. HARDEMAN, Stenographer.

Bureau of Immigration.

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AGRICULTURAL SPECIAL TRAIN.

Special Will Leave Nashville, Wednesday, July 15—Tour Will End on Tuesday, September 15.

The great good accomplished by the Agricultural Demonstration trains operated by the Department of Agriculture in 1911 and 1912, and the numerous requests from all sections of the State for the running of another Agricultural Special this year, have induced the Department of Agriculture to again undertake this enterprise for the summer of 1914.

More than 250 points on the railroad lines of Tennessee were made by the train run in 1912, which traveled more than 6,000 miles and was seen by more than 200,000 people, principally farmers and their families. The train carried exhibits and demonstrations helpful to every phase of rural life, and its good effects are still felt and will continue to be felt throughout the State for many years to come.

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J. F. Peck

tion will deliver the lectures, and this means that there will be no additional cost for these, as they are already on salary.

The railroads cooperating with the Department of Agriculture this year in operating the train include every road doing business in the State. They are:

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Southern Railway, and allied lines.

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The Birmingham & Northwestern.

The Knoxville, Sevierville & Eastern.

The Carolina, Clinchfield & Ohio.

The Tennessee, Kentucky & Northern.

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Car No. 1 will be the Farm Crops Car, and will be in charge of A. L. Garrison, Chief Feed, Seed and Fertilizer Inspector, with capable assistants. It will contain exhibits of forage crops, grasses, grains, fertilizers, feeds, seeds, etc.

Car No. 2 will be the Fruits, Vegetables and Apiary Car, and will be in charge of State Entomologist G. M. Bentley and State Apiary Inspector J. S. Ward. It will have exhibits of fruits, vegetables, spraying appliances for the apiary, and literature for free distribution on these subjects.

Car No. 3 will be Live Stock Car, with Dr. George R. White, State Veterinarian, in charge. This car will be fitted up in the most modern style with the best dairy and barn equipment. It will carry an exhibit of animals which will be interesting as well as instructive. It has been planned to carry animals which have been bred in Tennessee and owned by private individuals located in different sections of the state. Typical animals of the respective types will be furnished by the following owners:

Cattle—Polled shorthorn heifer, C. J. Bullock, Cookeville; Aberdeen Angus, not yet selected; Hereford heifer, W. J. Robinson, Lancaster; Jersey heifer, Percy C. Brown, Spring Hill; Holstein heifer, Simeon Hill, Memphis; Guernsey heifer, Simeon Hill, Memphis.

Sheep—Cheviot, H. C. Davidson, Elbridge; Dorsett, Percy C. Brown, Spring Hill; Southdown, Percy C. Brown, Spring Hill.

Swine—Berkshire, J. W. Russwurm, Nashville; Hampshire, A. L. Garri-

son, Crossville; Duroc Jersey, not yet selected; Yorkshire, Percy C. Brown, Spring Hill; Poland China, Jay R. Mitchell, Sparta.

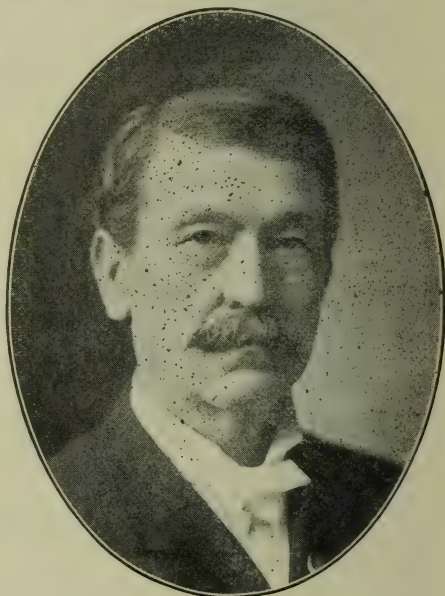
It is hoped that the live stock exhibit with the instructive lectures delivered at every stop, will tend to promote interest in pure-bred animals on Tennessee farms.

Car No. 4 will be the Health Car, and will be under the auspices of the State Board of Health, with Dr. Lucius P. Brown, State Pure Food and Drugs Inspector, actively in charge. It will contain exhibits showing the extensive work of the State Board of Health, the Anti-Tuberculosis League, the State Pure Food and Drugs Department in the betterment of health conditions in Tennessee and the protection of the consumer from adulterated and impure foods and short measure.

Car No. 5 will be the Education Car, and in charge of Prof. M. W. Robinson, Agricultural Supervisor in the High Schools. This car will contain



T. G. Settle.



Col Robert Gates, L. & N. R. R.

exhibits showing the work of the State Department of Education in promoting the study of agriculture in the schools, and will also have exhibits from the industrial departments of the State Normal schools at Murfreesboro, Memphis and Johnson City.

Car No. 6 will be the Domestic Science and Dairy Car, and will be under the supervision of Miss Lucy Buttorff, a trained lecturer on domestic science, and T. B. Robinson, a dairy expert. This car will have exhibits showing the latest in conveniences for the farm home and the dairy.

Car No. 7 will be the Platform Car for live stock demonstration, and will also be fitted with a crusher for grinding limestone for fertilizing purposes, and literature on this subject will be distributed, and the operation of the machine explained. This car will also have an engine and dynamo to

furnish power for the crusher and light for the train, which will be electrically lighted throughout, enabling night stops and demonstrations.

Car No. 8 will be the Dining Car, in charge of Mrs. John W. Thomas. This will be outfitted to accommodate all those accompanying the train, including the operating crews.

Car No. 9 will be the Sleeping Car, which will accommodate all those who will be with the train throughout the entire trip.

Farm bulletins, agricultural papers, and other literature will be distributed at every stop of the train. These will cover all subjects of interest to the farmer and his family, and there will be an abundant supply.

TAKES PLACE OF INSTITUTE.

The Agricultural Special will take the place of county institutes in the counties it is enabled to reach, and it is expected to be more beneficial and effective, because the train and its exhibits will be seen by a much larger number of people in the rural communities than could possibly be gotten to attend the institutes. County institute work has been and is being conducted in those counties not reached by railroads.

The train is to be operated at a time when the farmer and his family have the most leisure, and it is hoped by the Commissioner of Agriculture that every one who is convenient to the scheduled stops will attend. They will see on the train what many of them would not have an opportunity to see otherwise. They will see the finest types of beef and dairy cattle, the best breeds of sheep and hogs, and the best poultry, and hear the very best lectures on these subjects. They will learn about the silo—how to build it and how to fill it and feed ensilage. They will learn about agricultural lime for sweetening their soils, and how to grow clover, and all about winter cover crops.

They will be enabled to see the most practical in dairy equipment; about the care of the orchard, spraying and pruning trees, and about marketing fruits and vegetables; about the honeybee—how to keep it with pleasure and profit; about the work that is being done by the State Department of Agriculture to eradicate hog cholera from the State, and see demonstrations of the use of cholera serum and the virus in the simultaneous treatment for this scourge, and will be instructed in the use of this serum and virus, which will render their swine absolutely immune from this deadly disease.

Visitors to the train will be shown the progress that has been made for rural education in the State, and will be told the benefits and advantages of rural community cooperation. They can learn how to prevent disease by using preventive measures. The farmers' wives and daughters may learn about domestic science and home economics, and

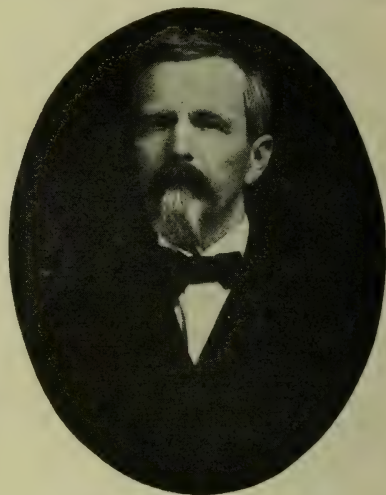
what is being done to make home life on the farm more comfortable and more attractive.

The farmer who leaves the "shade of the old apple tree" on the farm, traveling miles over dusty highways to the railroad, will find that his time has not been wasted, and that he will gain useful information that will enable him to do better along all lines than he has done in the past. A visit to the train can not be without profit. The train is planned to offer helpful suggestions that may be easily put into practice, and this opportunity should be taken advantage of by every farmer in the State who is convenient to any of the scheduled stopping places.

Those having the train in charge will leave nothing undone to make the tour a success, in that it will disseminate useful information for the benefit of all who may care to learn. The dates will be pub-



Dr. Geo. R. White.



Jesse Tomlinson

lished often in the county papers, and by posters, so that every one may be ready to take a day off and profit by a visit to the Agricultural Special.

THE PERSONNEL OF THE TRAIN.

The Agricultural Special will be in charge and under the direct supervision of Commissioner of Agriculture T. F. Peck, who has designated the following to assist him in this tour:

Dr. George R. White, State Veterinarian, live stock.

T. G. Settle, Chief Clerk.

A. L. Garrison, Chief Feed, Seed and Fertilizer Inspector, soils and crops.

G. M. Bentley, State Entomologist, fruits, vegetables, orchards and nurseries.

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J. F. Cook

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Car No. 2 will be the Fruits, Vegetables and Apiary Car, and will be in charge of State Entomologist G. M. Bentley and State Apiary Inspector J. S. Ward. It will have exhibits of fruits, vegetables, spraying appliances for the apiary, and literature for free distribution on these subjects.

Car No. 3 will be Live Stock Car, with Dr. George R. White, State Veterinarian, in charge. This car will be fitted up in the most modern style with the best dairy and barn equipment. It will carry an exhibit of animals which will be interesting as well as instructive. It has been planned to carry animals which have been bred in Tennessee and owned by private individuals located in different sections of the state. Typical animals of the respective types will be furnished by the following owners:

Cattle—Polled shorthorn heifer, C. J. Bullock, Cookeville; Aberdeen Angus, not yet selected; Hereford heifer, W. J. Robinson, Lancaster; Jersey heifer, Percy C. Brown, Spring Hill; Holstein heifer, Simeon Hill, Memphis; Guernsey heifer, Simeon Hill, Memphis.

Sheep—Cheviot, H. C. Davidson, Elbridge; Dorsett, Percy C. Brown, Spring Hill; Southdown, Percy C. Brown, Spring Hill.

Swine—Berkshire, J. W. Russwurm, Nashville; Hampshire, A. L. Garri-

son, Crossville; Duroc Jersey, not yet selected; Yorkshire, Percy C. Brown, Spring Hill; Poland China, Jay R. Mitchell, Sparta.

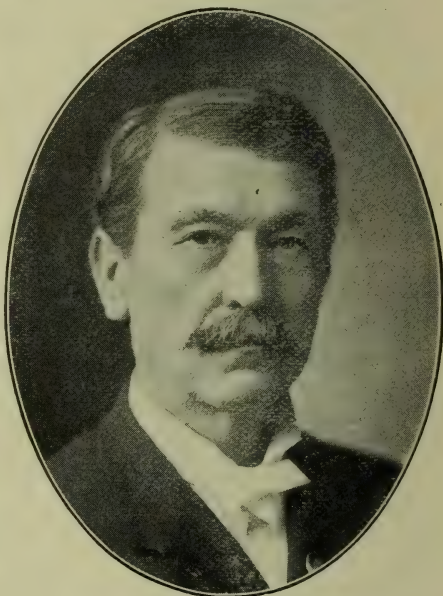
It is hoped that the live stock exhibit with the instructive lectures delivered at every stop, will tend to promote interest in pure-bred animals on Tennessee farms.

Car No. 4 will be the Health Car, and will be under the auspices of the State Board of Health, with Dr. Lucius P. Brown, State Pure Food and Drugs Inspector, actively in charge. It will contain exhibits showing the extensive work of the State Board of Health, the Anti-Tuberculosis League, the State Pure Food and Drugs Department in the betterment of health conditions in Tennessee and the protection of the consumer from adulterated and impure foods and short measure.

Car No. 5 will be the Education Car, and in charge of Prof. M. W. Robinson, Agricultural Supervisor in the High Schools. This car will contain



T. G. Settle.



Col Robert Gates, L. & N. R. R.

exhibits showing the work of the State Department of Education in promoting the study of agriculture in the schools, and will also have exhibits from the industrial departments of the State Normal schools at Murfreesboro, Memphis and Johnson City.

Car No. 6 will be the Domestic Science and Dairy Car, and will be under the supervision of Miss Lucy Buttorff, a trained lecturer on domestic science, and T. B. Robinson, a dairy expert. This car will have exhibits showing the latest in conveniences for the farm home and the dairy.

Car No. 7 will be the Platform Car for live stock demonstration, and will also be fitted with a crusher for grinding limestone for fertilizing purposes, and literature on this subject will be distributed, and the operation of the machine explained. This car will also have an engine and dynamo to

furnish power for the crusher and light for the train, which will be electrically lighted throughout, enabling night stops and demonstrations.

Car No. 8 will be the Dining Car, in charge of Mrs. John W. Thomas. This will be outfitted to accommodate all those accompanying the train, including the operating crews.

Car No. 9 will be the Sleeping Car, which will accommodate all those who will be with the train throughout the entire trip.

Farm bulletins, agricultural papers, and other literature will be distributed at every stop of the train. These will cover all subjects of interest to the farmer and his family, and there will be an abundant supply.

TAKES PLACE OF INSTITUTE.

The Agricultural Special will take the place of county institutes in the counties it is enabled to reach, and it is expected to be more beneficial and effective, because the train and its exhibits will be seen by a much larger number of people in the rural communities than could possibly be gotten to attend the institutes. County institute work has been and is being conducted in those counties not reached by railroads.

The train is to be operated at a time when the farmer and his family have the most leisure, and it is hoped by the Commissioner of Agriculture that every one who is convenient to the scheduled stops will attend. They will see on the train what many of them would not have an opportunity to see otherwise. They will see the finest types of beef and dairy cattle, the best breeds of sheep and hogs, and the best poultry, and hear the very best lectures on these subjects. They will learn about the silo—how to build it and how to fill it and feed ensilage. They will learn about agricultural lime for sweetening their soils, and how to grow clover, and all about winter cover crops.

They will be enabled to see the most practical in dairy equipment; about the care of the orchard, spraying and pruning trees, and about marketing fruits and vegetables; about the honeybee—how to keep it with pleasure and profit; about the work that is being done by the State Department of Agriculture to eradicate hog cholera from the State, and see demonstrations of the use of cholera serum and the virus in the simultaneous treatment for this scourge, and will be instructed in the use of this serum and virus, which will render their swine absolutely immune from this deadly disease.

Visitors to the train will be shown the progress that has been made for rural education in the State, and will be told the benefits and advantages of rural community cooperation. They can learn how to prevent disease by using preventive measures. The farmers' wives and daughters may learn about domestic science and home economics, and

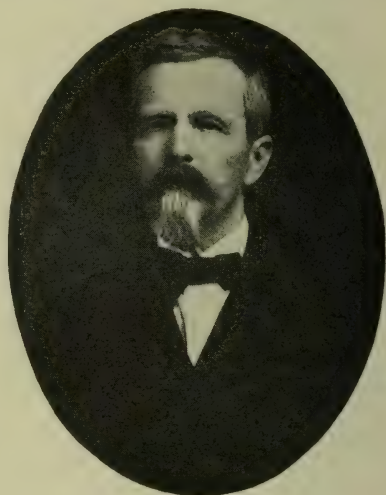
what is being done to make home life on the farm more comfortable and more attractive.

The farmer who leaves the "shade of the old apple tree" on the farm, traveling miles over dusty highways to the railroad, will find that his time has not been wasted, and that he will gain useful information that will enable him to do better along all lines than he has done in the past. A visit to the train can not be without profit. The train is planned to offer helpful suggestions that may be easily put into practice, and this opportunity should be taken advantage of by every farmer in the State who is convenient to any of the scheduled stopping places.

Those having the train in charge will leave nothing undone to make the tour a success, in that it will disseminate useful information for the benefit of all who may care to learn. The dates will be pub-



Dr. Geo. R. White.



Jesse Tomlinson

lished often in the county papers, and by posters, so that every one may be ready to take a day off and profit by a visit to the Agricultural Special.

THE PERSONNEL OF THE TRAIN.

The Agricultural Special will be in charge and under the direct supervision of Commissioner of Agriculture T. F. Peck, who has designated the following to assist him in this tour:

Dr. George R. White, State Veterinarian, live stock.

T. G. Settle, Chief Clerk.

A. L. Garrison, Chief Feed, Seed and Fertilizer Inspector, soils and crops.

G. M. Bentley, State Entomologist, fruits, vegetables, orchards and nurseries.

Dr. J. S. Ward, State Inspector of Apiaries, lectures on the honeybee.

J. N. Meroney, silos.

Jesse Tomlinson, Assistant Commissioner of Agriculture, lectures on community cooperation.

R. T. DeBerry, Assistant Commissioner of Agriculture, lectures on truck growing.

J. A. Dinwiddie, Assistant Commissioner of Agriculture, lectures on poultry and poultry products.

Prof. H. A. Morgan, Director of the Experiment Station, University of Tennessee.

Dr. B. W. Murphy, live stock.

Dr. J. C. Schoenlaub, live stock.

Frank Van Pelt, farm machinery.

W. B. Shoulders, live stock.

J. J. Kittell, live stock breeding.

N. C. White, stock feeds.

J. W. Wynn, fertilizers.

A. M. Stout, field seeds.

J. W. Russwurm, Tennessee State Fair.

T. B. Robinson, dairying.

W. C. Jones, exhibits.

Bruce Settle, exhibits.

Mrs. John W. Thomas, dining car.

H. N. Hardeman, stenographer.

J. B. Curd, Tennessee State Fair.

S. H. Thompson, State Superintendent of Public Instruction.

W. R. Bowine, Department of Education.

S. Y. Adcock, Department of Education.

M. W. Robinson, State Department of Education.

Dr. R. Q. Lillard, State Board of Health.

Dr. Olin West, State Board of Health.

Dr. H. H. Shoulders, State Board of Health.

Dr. L. P. Brown, State Pure Food and Drugs Inspector.

George G. Draper.

Dr. T. B. Hughes.

Miss Lucy Buttorff, domestic science.

Miss Nettie Armstrong, domestic science.

Miss Helen Buquo, domestic science.

Miss Zelma Biggs, education.

Miss Hera Robinson, education.

Verd Peterson, agriculture in Middle Tennessee Normal.

W. J. Sowder, agriculture in East Tennessee Normal.

V. S. Bright, agriculture in West Tennessee Normal.

Prof. R. L. Jones, President Middle Tennessee Normal.

Prof. J. W. Brister, President West Tennessee Normal.

Prof. S. G. Gilbreath, President East Tennessee Normal.

Not all of those named above will be with the train throughout the entire tour, but will alternate in the three grand divisions of the State.

ITINERARY OF THE SPECIAL.

The Agricultural Special will leave Nashville at 9:30 a.m., Wednesday, July 15, over the Tennessee Central Railroad. About 300 stops have been scheduled, and in making these, the train will travel about 6,500 miles. The itinerary, as prepared by the Department of Agriculture and approved by the railroads, is as follows:

TENNESSEE CENTRAL RAILROAD.

Wednesday, July 15.

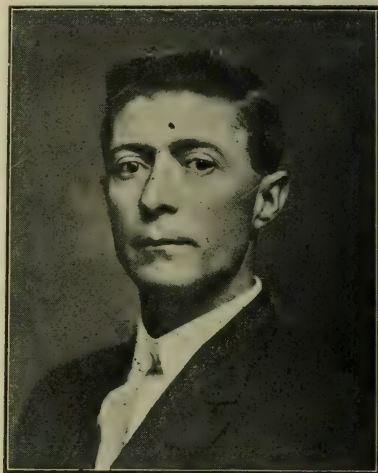
Ashland City—10:30 a. m. to 12:30 p. m.

Doddsville—1:30 p. m. to 3:00 p. m.

Spaulding—3:30 p. m. to 4:30 p. m.



A. L. Garrison



R. T. DeBerry

Thursday, July 16.

Mt. Juliet—9:30 a. m. to 11:00 a. m.

Lebanon—11:45 a. m. to 1:30 p. m.

Brush Creek—4:10 p. m. to 5:30 p. m.

Hickman—Night Meeting, 7:30 p. m.

Watertown—2:15 p. m. to 3:45 p. m.

Friday, July 17.

Gordonsville—8:30 a. m. to 10:00 a. m.

Carthage—10:20 a. m. to 12:00 a. m.

Lancaster—12:30 p. m. to 2:00 p. m.

Buffalo Valley—2:15 p. m. to 4:00 p. m.

Baxter—4:30 p. m. to 5:30 p. m.

Bloomington—Night Meeting, 7:30 p. m.

Saturday, July 18.

Cookeville—8:30 a. m. to 10:00 a. m.

Algood—10:15 a. m. to 11:00 a. m.
 Livingston—12:30 p. m. to 2:00 p. m.
 Monterey—4:30 p. m. to 5:30 p. m.
 Mayland—Night Meeting, 7:30 p. m.

Monday, July 20.

Crossville—8:30 a. m. to 10:30 a. m.
 Crab Orchard—11:15 a. m. to 12:30 p. m.
 Daysville—12:50 p. m. to 2:00 p. m.
 Cardiff—2:30 p. m. to 3:30 p. m.
 Harriman—3:45 p. m. to 5:30 p. m.

QUEEN AND CRESCENT ROUTE.

Tuesday, July 21.

Oakdale—10:20 a. m. to 11:00 a. m.
 Lancing—11:35 a. m. to 12:15 p. m.
 Sunbright—12:35 p. m. to 1:00 p. m.
 Glen Mary—1:15 p. m. to 2:00 p. m.
 New River—2:15 p. m. to 3:00 p. m.
 Helenwood—3:10 p. m. to 4:00 p. m.
 Oneida—4:10 p. m. to 5:30 p. m.

Wednesday, July 22.

Melville—8:30 a. m. to 9:10 a. m.
 Rathburn—9:20 a. m. to 9:50 a. m.
 Sale Creek—10:05 a. m. to 10:40 a. m.
 Graysville—10:55 a. m. to 11:30 a. m.
 Dayton—11:45 a. m. to 1:30 p. m.
 Evensville—1:45 p. m. to 2:20 p. m.
 Spring City—2:45 p. m. to 3:40 p. m.
 Rockwood—4:25 p. m. to 5:10 p. m.

SOUTHERN RAILWAY.

Thursday, July 23.

Oliver Springs—9:45 a. m. to 11:00 a. m.
 Marlow—11:20 a. m. to 12:25 p. m.
 Clinton—1:00 p. m. to 3:00 p. m.
 Vasper—3:45 p. m. to 5:00 p. m.
 Pioneer—Night Meeting, 7:30 p. m.

Friday, July 24.

Maloneyville—9:00 a. m. to 10:00 a. m.
 Corryton—10:20 a. m. to 11:30 a. m.
 Luttrell—11:45 a. m. to 12:30 p. m.
 Liberty Hill—1:15 p. m. to 2:00 p. m.
 Lone Mountain—2:30 p. m. to 3:30 p. m.
 Tazewell—3:45 p. m. to 4:30 p. m.
 Cumberland Gap—Night Meeting, 7:30 p. m.

Saturday, July 25.

Blaine—10:00 a. m. to 11:00 a. m.
 Red House—11:10 a. m. to 12:00 m.
 Joppa—12:15 p. m. to 1:00 p. m.
 Rutledge—1:20 p. m. to 2:20 p. m.
 Clinchdale—2:45 p. m. to 3:45 p. m.
 Crosby—4:30 p. m. to 5:30 p. m.

Monday, July 27.

Straw Plains—9:30 a. m. to 10:30 a. m.
 New Market—10:50 a. m. to 1:00 p. m.
 Jefferson City—1:15 p. m. to 2:30 p. m.
 Talbott—2:45 p. m. to 3:30 p. m.
 Morristown—3:50 p. m. to 5:30 p. m.



G. M. Bentley.



State Supt. S. H. Thompson

Tuesday, July 28.

Russellville—8:45 a. m. to 10:00 a. m.
 Bull's Gap—10:20 a. m. to 11:30 a. m.
 Mosheim—12:05 p. m. to 1:00 p. m.
 Greeneville—1:20 p. m. to 3:00 p. m.
 Chuckey—3:30 p. m. to 4:30 p. m.
 Limestone—4:40 p. m. to 5:30 p. m.
 Jonesboro—Night Meeting, 7:30 p. m.

Wednesday, July 29.

Johnson City—9:00 a. m. to 10:30 a. m.
 Watauga—10:45 a. m. to 12:00 m.
 Bluff City—12:15 p. m. to 2:00 p. m.
 Vance—2:15 p. m. to 3:40 p. m.
 Bristol—Night Meeting, 7:30 p. m.

Thursday, July 30.

Elizabethton—9:00 a. m. to 10:30 a. m.

Butler—11:30 a. m. to 1:00 p. m.

Maymead—1:35 p. m. to 2:45 p. m.

Mountain City—3:15 p. m. to 4:30 p. m.

CAROLINA, CLINCHFIELD & OHIO RAILROAD.

Friday, July 31.

Erwin—9:00 a. m. to 10:30 a. m.

Unicoi—10:50 a. m. to 11:45 a. m.

Normal—12:15 p. m. to 1:15 p. m.

Fordtown—2:00 p. m. to 2:30 p. m.

Kingsport—3:00 p. m. to 4:00 p. m.

Cameron—4:20 p. m. to 5:30 p. m.

SOUTHERN RAILWAY.

Saturday, August 1.

White Pine—8:30 a. m. to 9:15 a. m.

Newport—10:00 a. m. to 12:00 m.

Del Rio—12:20 p. m. to 1:30 p. m.

Wolf Creek—1:50 p. m. to 2:45 p. m.

Rogersville—Night Meeting, 7:30 p. m.

KNOXVILLE, SEVIERVILLE & EASTERN RAILROAD.

Monday, August 3.

Klondike—9:00 a. m. to 10:00 a. m.

Boyd's Creek—10:30 a. m. to 12:00 m.

Sevierville—12:30 p. m. to 2:30 p. m.

LOUISVILLE & NASHVILLE RAILROAD.

Tuesday, August 4.

Byington—9:45 a. m. to 11:00 a. m.

Edgmoor—11:20 a. m. to 12:15 p. m.

Coal Creek—1:00 p. m. to 2:00 p. m.

Jacksboro—2:30 p. m. to 3:30 p. m.

La Follette—3:45 p. m. to 5:00 p. m.

Wednesday, August 5.

Armona—8:00 a. m. to 9:30 a. m.

Maryville—10:00 a. m. to 12:00 m.

Louisville—12:45 p. m. to 1:45 p. m.

Friendsville—2:15 p. m. to 3:30 p. m.

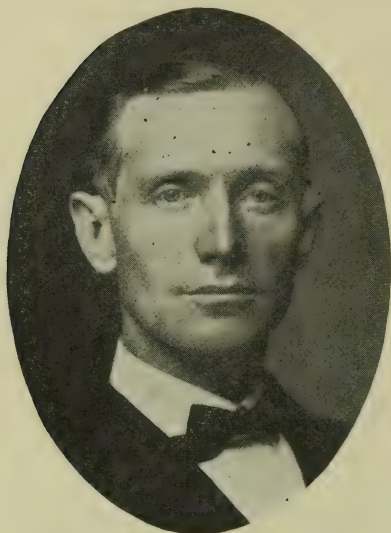
Greenback—4:00 p. m. to 5:00 p. m.

Thursday, August 6.

Vonore—9:00 a. m. to 10:00 a. m.
 Madisonville—10:30 a. m. to 12:30 p. m.
 Englewood—1:00 p. m. to 2:30 p. m.
 Tellico Plains—3:30 p. m. to 5:00 p. m.

Friday, August 7.

Etowah—9:00 a. m. to 11:00 a. m.
 Benton—12:00 m. to 2:00 p. m.
 Binfield—4:00 p. m. to 5:00 p. m.



Prof. M. W. Robinson



Dr. H. H. Shoulders.

SOUTHERN RAILWAY.

Saturday, August 8.

Concord—8:15 a. m. to 9:30 a. m.
 Lenoir City—10:00 a. m. to 11:00 a. m.
 Loudon—11:20 a. m. to 1:10 p. m.
 Philadelphia—1:20 p. m. to 2:30 p. m.
 Sweetwater—2:50 p. m. to 4:30 p. m.
 Niota—4:50 p. m. to 5:30 p. m.

Monday, August 10.

Athens—9:00 a. m. to 10:30 a. m.
 Riceville—10:50 a. m. to 11:45 a. m.
 Calhoun—12:05 p. m. to 1:00 p. m.
 Tasso—1:20 p. m. to 2:20 p. m.
 Cleveland—2:40 p. m. to 4:00 p. m.

Tuesday, August 11.

McDonald—8:30 a. m. to 9:30 a. m.
 Ooltewah—9:50 a. m. to 11:30 a. m.
 Tyner—12:00 m. to 2:30 p. m.

NASHVILLE, CHATTANOOGA & ST. LOUIS RAILWAY.

Wednesday, August 12.

Whiteside—8:45 a. m. to 10:00 a. m.
 Jasper—11:15 a. m. to 1:00 p. m.
 Whitwell—1:30 p. m. to 2:30 p. m.
 Dunlap—3:15 p. m. to 4:15 p. m.
 Pikeville—Night Meeting, 7:30 p. m.

Thursday, August 13.

Sherwood—10:00 a. m. to 11:00 a. m.
 Cowan—11:30 a. m. to 12:30 p. m.
 Tracy City—1:30 p. m. to 3:00 p. m.
 Coalmont—3:20 p. m. to 4:30 p. m.

Friday, August 14.

Decherd—9:00 a. m. to 10:00 a. m.
 Winchester—10:15 a. m. to 11:30 a. m.
 Belvidere—11:50 a. m. to 1:00 p. m.
 Huntland—1:20 p. m. to 2:20 p. m.
 Elora—2:40 p. m. to 3:40 p. m.
 Fayetteville—4:30 p. m. to 5:30 p. m.

Saturday, August 15.

Howell—9:00 a. m. to 10:00 a. m.
 Petersburg—10:20 a. m. to 11:30 a. m.
 Lewisburg—12:15 p. m. to 2:00 p. m.
 Bryant—2:30 p. m. to 3:30 p. m.

Monday, August 17.

Estill Springs—8:00 a. m. to 9:30 a. m.
 Tullahoma—9:50 a. m. to 11:30 a. m.
 Manchester—12:00 m. to 1:30 p. m.
 McMinnsville—2:30 p. m. to 4:00 p. m.

Tuesday, August 18.

Rock Island—9:00 a. m. to 10:00 a. m.
 Quebeck—10:15 a. m. to 11:15 a. m.
 Doyle—11:30 a. m. to 12:30 p. m.
 Sparta—1:00 p. m. to 3:00 p. m.

Wednesday, August 19.

Normandy—9:00 a. m. to 10:00 a. m.
 Wartrace—10:30 a. m. to 12:00 m.
 Shelbyville—12:30 p. m. to 2:30 p. m.
 Bell Buckle—3:00 p. m. to 4:00 p. m.
 Christiana—4:30 p. m. to 5:30 p. m.

Thursday, August 20.

Murfreesboro—9:00 a. m. to 10:30 a. m.
 Florence—10:50 a. m. to 11:45 a. m.

Smyrna—12:00 m. to 1:00 p. m.
 Lavergne—1:15 p. m. to 2:15 p. m.
 Antioch—2:35 p. m. to 3:30 p. m.

Friday, August 21.

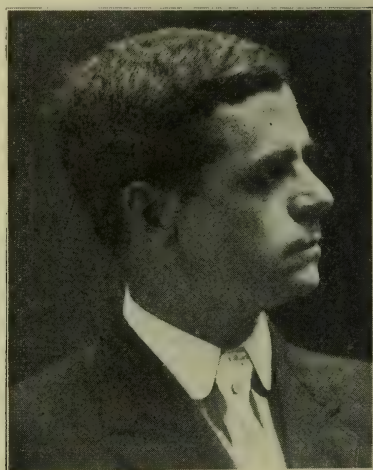
Bellevue—9:15 a. m. to 10:15 a. m.
 Kingston Springs—10:45 a. m. to 11:45 a. m.
 Burns—12:20 p. m. to 1:20 p. m.
 Dickson—1:35 p. m. to 3:00 p. m.
 Nunnely—4:15 p. m. to 5:30 p. m.
 Centreville—Night Meeting, 7:30 p. m.

Saturday, August 22.

Kimmins—8:45 a. m. to 10:00 a. m.
 Hohenwald—10:20 a. m. to 12:30 p. m.
 Allen's Creek—1:00 p. m. to 2:00 p. m.
 Tennessee City—Night Meeting, 7:30 p. m.



Dr. Olin West



Dr. L. P. Brown.

Monday, August 24.

McEwen—9:00 a. m. to 10:00 a. m.
 Waverly—10:30 a. m. to 12:00 m.
 Denver—12:25 a. m. to 1:30 p. m.
 Camden—2:00 p. m. to 3:30 p. m.
 Rosser—4:15 p. m. to 5:30 p. m.

Tuesday, August 25.

Huntingdon—9:00 a. m. to 10:00 a. m.
 McKenzie—10:35 a. m. to 12:00 m.
 Gleason—12:25 p. m. to 1:30 p. m.
 Dresden—1:50 p. m. to 3:00 p. m.
 Martin—3:30 p. m. to 5:00 p. m.
 Union City—Night Meeting, 7:30 p. m.

Wednesday, August 26.

Vale—9:00 a. m. to 10:00 a. m.
 Mansfield—10:20 a. m. to 11:20 a. m.
 Vandyke—11:35 a. m. to 1:30 p. m.
 Whitlock—2:00 p. m. to 3:00 p. m.
 Puryear—3:20 p. m. to 4:30 p. m.
 Paris—Night Meeting, 7:30 p. m.

Thursday, August 27.

Buena Vista—9:00 a. m. to 10:00 a. m.
 Westport—10:20 a. m. to 11:15 a. m.
 Wildersville—11:45 a. m. to 12:30 p. m.
 Lexington—1:00 p. m. to 2:30 p. m.
 Huron—3:00 p. m. to 4:00 p. m.
 Luray—4:15 p. m. to 5:15 p. m.

Friday, August 28.

Denmark—8:45 a. m. to 10:00 a. m.
 Whiteville—10:45 a. m. to 11:30 a. m.
 Somerville—12:15 p. m. to 1:45 p. m.
 Oakland—2:15 p. m. to 3:15 p. m.
 Cordova—4:00 p. m. to 5:00 p. m.

SOUTHERN RAILWAY.

Saturday, August 29.

Germantown—8:40 a. m. to 10:00 a. m.
 Collierville—10:25 a. m. to 11:30 a. m.
 Moscow—12:15 p. m. to 1:15 p. m.
 Saulsbury—2:15 p. m. to 3:15 p. m.
 Middleton—4:00 p. m. to 5:00 p. m.

MOBILE & OHIO RAILWAY.

Monday, August 31.

Selmer—8:30 a. m. to 10:00 a. m.
 McNairy—10:30 a. m. to 12:00 m.
 Finger—12:15 p. m. to 1:30 p. m.
 Henderson—1:45 p. m. to 2:45 p. m.
 Pinson—3:05 p. m. to 4:00 p. m.
 Perry—4:20 p. m. to 5:30 p. m.

Tuesday, September 1.

Humboldt—9:00 a. m. to 10:30 a. m.
 Fruitland—10:45 a. m. to 12:00 m.
 Trenton—12:30 p. m. to 2:30 p. m.
 Dyer—2:50 p. m. to 4:00 p. m.
 Rutherford—4:15 p. m. to 5:00 p. m.
 Kenton—Night Meeting, 7:30 p. m.

ILLINOIS CENTRAL RAILWAY.

Wednesday, September 2.

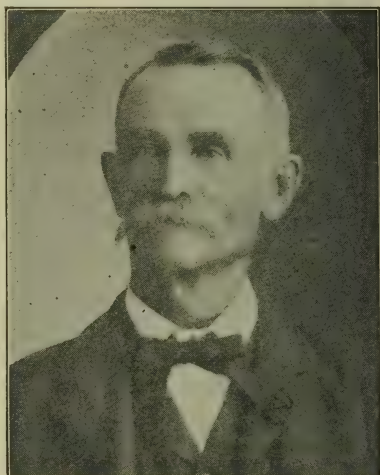
Obion—9:00 a. m. to 10:00 a. m.
 Trimble—10:15 a. m. to 11:15 a. m.
 Newbern—11:45 a. m. to 12:30 p. m.
 Dyersburg—1:00 p. m. to 2:30 p. m.
 Lenox—3:00 p. m. to 4:00 p. m.
 Ridgely—4:30 p. m. to 5:30 p. m.
 Tiptonville—Night Meeting, 7:30 p. m.

Thursday, September 3.

Halls—9:00 a. m. to 10:00 a. m.
 Ripley—10:45 a. m. to 12:00 m.
 Covington—1:00 p. m. to 2:30 p. m.
 Brighton—3:00 p. m. to 4:00 p. m.
 Kerrville—4:30 p. m. to 5:30 p. m.



Prof. J. W. Brister.



J. N. Meroney.

Friday, September 4.

Hickory Valley—9:00 a. m. to 10:00 a. m.
 Bolivar—10:30 a. m. to 11:30 a. m.
 Toone—11:50 a. m. to 1:00 p. m.
 Medina—2:30 p. m. to 3:30 p. m.
 Sitka—3:45 p. m. to 4:30 p. m.
 Milan—Night Meeting, 7:30 p. m.

Saturday, September 5.

Bradford—8:30 a. m. to 9:30 a. m.
 Greenfield—9:50 a. m. to 11:00 a. m.
 Sharon—11:15 a. m. to 12:15 p. m.
 Hillside—12:45 p. m. to 2:00 p. m.
 McConnell—2:30 p. m. to 3:30 p. m.

BIRMINGHAM & NORTHWESTERN RAILROAD.

Monday, September 7.

Bells—9:00 a. m. to 10:30 a. m.
 Alamo—11:00 a. m. to 12:30 p. m.
 Crockett Mills—1:00 p. m. to 2:00 p. m.
 Friendship—2:20 p. m. to 3:30 p. m.
 Tigrett—3:45 p. m. to 5:00 p. m.

LOUISVILLE & NASHVILLE RAILROAD.

Tuesday, September 8.

Brownsville—9:15 a. m. to 10:30 a. m.
 Stanton—11:00 a. m. to 12:00 m.
 Mason—12:30 p. m. to 1:30 p. m.
 Galloway—2:00 p. m. to 3:00 p. m.
 Brunswick—3:30 p. m. to 5:00 p. m.

Wednesday, September 9.

Gadsden—9:00 a. m. to 10:00 a. m.
 Gibson—10:30 a. m. to 11:30 a. m.
 Atwood—12:00 m. to 1:00 p. m.
 Trezevant—1:15 p. m. to 2:30 p. m.
 Henry—3:30 p. m. to 4:30 p. m.

Thursday, September 10.

Springville—8:30 a. m. to 9:30 a. m.
 Big Sandy—9:45 a. m. to 10:45 a. m.
 Danville—11:15 a. m. to 12:15 p. m.
 Tennessee Ridge—12:45 p. m. to 1:45 p. m.
 Bear Springs—2:30 p. m. to 3:30 p. m.
 Erin—4:30 p. m. to 5:30 p. m.
 Cumberland City—Night Meeting, 7:30 p. m.

Friday, September 11.

Palmyra—9:00 a. m. to 10:00 a. m.
 St. Bethlehem—10:45 a. m. to 12:00 m.
 Adams—1:00 p. m. to 2:00 p. m.
 Cedar Hill—2:15 p. m. to 3:00 p. m.
 Springfield—3:20 p. m. to 4:30 p. m.
 Goodlettsville—5:15 p. m. to 6:00 p. m.

Saturday, September 12.

Madison—9:00 a. m. to 10:00 a. m.
 Gallatin—11:00 a. m. to 12:30 p. m.
 Portland—1:10 p. m. to 2:00 p. m.
 Hartsville—3:30 p. m. to 5:00 p. m.

Monday, September 14.

Franklin—8:50 a. m. to 10:30 a. m.

Ewells—11:10 a. m. to 12:10 p. m.
Columbia—1:00 p. m. to 2:00 p. m.
Lynnville—2:45 p. m. to 3:45 p. m.
Pulaski—4:30 p. m. to 5:30 p. m.
Prospect—Night Meeting, 7:30 p. m.

Tuesday, September 15.

Mt. Pleasant—8:30 a. m. to 9:30 a. m.
Summertown—10:00 a. m. to 11:00 a. m.
Ethridge—11:20 a. m. to 12:15 p. m.
Lawrenceburg—12:45 p. m. to 1:45 p. m.
Leoma—2:05 p. m. to 3:00 p. m.
Loretto—3:25 p. m. to 4:15 p. m.
St. Joseph—4:30 p. m. to 5:30 p. m.
Iron City—Night Meeting, 7:30 p. m.

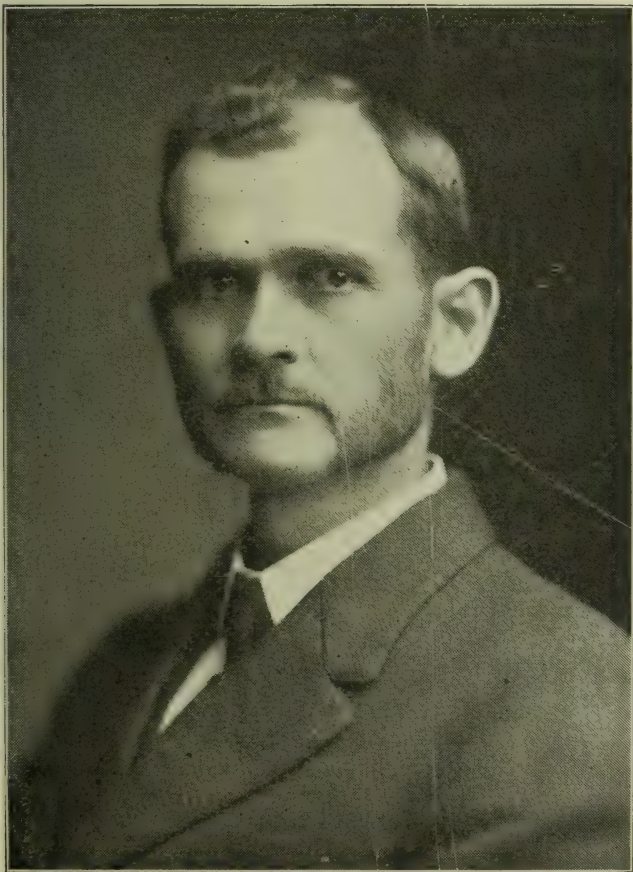
CONSERVATION OF ALL PRODUCTS RAISED ON THE FARM.

For several years the United States Department of Agriculture has been devoting a great deal of time toward solving one of the most important questions before the American farmer and fruit grower today. This is the conservation of all products on the farm, letting nothing go to waste. Special trains with leading government experts in charge have been sent out through the country to demonstrate and lecture on the various ways by which the enormous waste of this country can be turned into profit. While many subjects of great interest were discussed there was, perhaps, nothing of greater importance than the subject of caring for the millions of dollars' worth of fruits and vegetables that go to waste every year, by the canning process.

The advisability of canning the surplus at home or on the farm, where produced, was explained by these experts and steam canning outfits were shown so that the farmers and their wives could see how easily this work can be done. As the heat of boiling water is not sufficient to properly sterilize such foods as vegetables, meats, fish and a few fruits, the steam pressure method of canning is almost unanimously endorsed by the experts in this line. With a steam-tight receptacle canned foods may be subjected to a much higher degree of heat, and the ferment germs totally destroyed.

Many parts of the country are organized into canning clubs under the supervision of government agents. They hold meetings at intervals and the children, as well as the older people, are taught how to successfully can all food products. Lectures are given at these meetings by the person in charge, and prizes are awarded for the most perfect goods. This work is rapidly extending into all the States, and in a year or so the entire country will be organized into "canning clubs."

The farmer and fruit grower have a great deal to thank the United States government for. Unlimited praise is due our government for the educational work that is being done, in helping the farmer to realize greater profits for his produce.



DR. J. S. WARD, State Inspector of Apiaries.

TWOFOLD VALUE OF THE HONEYBEE.

BY J. S. WARD, STATE INSPECTOR OF APIARIES.

The majority of the people think that the only benefit humanity receives from bees is the production of honey and wax. This is a great mistake. The annual honey and wax harvest in Tennessee will approximate a half million dollars, and yet the bees have a value that is far greater than the wax and honey harvest. In the work of pollinating and cross-pollinating seed and fruit-bearing plants, so valuable to man, the bees do a work that has never been appreciated and yet has a value that is almost that of the fruit harvest itself.

In the transfer of pollen from stamens to stigmas, or from one blossom to another, the wind is an effective agent with many plants, provided it blows at the right time, in the right direction, and the



Profitable Apiary

pollen is ready to be thus scattered; but often this agent is non-effective on account of the pollen being too moist and sticky because of heavy dews, fogs or rain. Then the bees become the effective agents in carrying the pollen from flower to flower, a little sunshine between the showers will draw the busy workers from the hives and send them scampering into the flowers for that food—protein—which the bees must have for brood rearing.

It is during fruit blooming time that brood rearing is at its height and while the blooms yield the protein for the bees they in turn pollinate and cross-pollinate the blossoms. The bees feed their growing young on a balanced ration of honey and protein. The honey is gathered in the fall and stored away in considerable quantity, but

pollen or "bee-bread"—the protein-containing material—is not stored to any appreciable amount; it is practically gathered from day to day as needed. Much is needed in early spring, and Nature obliges the bees to crawl about over the blossoms of the fruit, gathering pollen and nectar for the maintenance of the colony, for self-preservation, and thereby inducing them to serve in pollinizing blossoms which would otherwise be unproductive of fruit or seed.

Bees seldom, if ever, visit flowers of different species on the same trip, but will visit different varieties of the same species. When peach trees are in bloom they stick closely to the peach blossoms; when apple blossoms are open they confine their labors to these. Even in nectar gathering the flavors and colors of the different honeys will be sharply outlined in the combs. We have a number of fruit-bearing plants where certain varieties are self-sterile, even where both male and female blossoms are on the same tree, as in the nut-bearing



Old Fashion Unprofitable Hives.

plants, or both sexes in the same flower, as in Gravenstein apple, for example. With these it is necessary to have pollen transferred from some other variety and perhaps from some distance away. Wind will not do it. Insects are the only means to fulfill this law of nature; and of all the insects only bees can be had in sufficient number so early in the season to do this great work.

Again, they are perfectly under the control of man. He can, by light feeding, stimulate them to brood-rearing sufficiently early in the spring to be assured of thousands of little pollinators of his fruit blossoms.

More and more is it being understood that the bees are a necessity for the growing of profitable crops of seeds and fruits; yes, and to such an extent that "if all the bees in the State were removed or killed many lines of agriculture would turn out to be dead failures instead of being extremely profitable ones as at present."

Is it a wonder, therefore, that people who know these things try so hard to preserve bees from destruction? Destruction by disease has taken a strong hold in the United States, and in some of the States has almost annihilated this priceless little insect. The layman may ask, Can this destruction be checked? The answer is easy. Bee diseases are understood and clearly defined. Their cures are simple and effective when intelligently and persistently administered. Educate all keepers of bees, for education means that disease will be recognized by each beekeeper and, being once recognized, is not difficult to cure.

However, to tell many beekeepers that bees are liable to disease is received with skepticism. To point out the dead and dying in the hive and urge treatment is regarded as useless and treated with indifference. Fortunate are we in Tennessee in having an apiary law, which not only provides for the education of people concerning bees in health, but provides for the inspection of diseased colonies and inflicts a reasonable punishment for inattention to treatment. Horticulturists, truck gardeners and beekeepers should all be united in their efforts to prevent the honeybee being destroyed by disease or by the careless spraying of fruit trees.

DO BEES INJURE FRUIT?

By DR. H. A. SURFACE, STATE ENTOMOLOGIST OF PENNSYLVANIA.

"My attention has been called to a paragraph in the Middleburg Post, of Thursday, September 21, to the effect that 'keeping bees in town has become a nuisance, and a great annoyance to everybody who raises grapes,' and further suggested spraying with white hellebore in sweetened water.

"As a student of natural history, as well as from the standpoint of a beekeeper of many colonies, and years of experience, and also from the official position of President of the Pennsylvania State Beekeepers' Association, and State Zoologist of Pennsylvania, I feel it my duty to write a few words for publication, correcting two errors expressed or implied in this paragraph.

"(1) The bees do not puncture nor directly damage the grapes.

Wasps and yellow jackets do puncture them. The grape is thus opened and damaged, and would either be sucked dry by other insects, or it would shrivel and decay. It is true that after it is opened by the other insects, the honeybee will suck out the sweet juices, but I have tried several times placing bunches of sound and ripe grapes where the honey bees could reach them, and have found them in each case to be entirely uninjured. Thus the bees should not be blamed for the damage to the grapes, as they are not responsible for it.

"(2) The second error is the intimation that they should be sprayed with white hellebore and sweetened water. Even if this would kill the bees, it would be quite wrong to destroy creatures which are so beneficial as these are in carrying pollen from flower to flower, and in many cases being the only method of insuring pollinization in the flower, and the setting of the fruit bud. It would also be a decided moral wrong to destroy the bees, as they are not public property, but are the property of individuals, and I am satisfied that a person who kills or destroys the property of another can be held legally responsible for so doing.

"(3) A further error, however, is in the implied thought that such spraying will kill the bees. Indeed it will not. It will do no good whatever toward protecting the grapes from insects of any kind, and will neither kill the bees, nor wasps, nor yellow jackets that are causing the real trouble. An arsenical spray might kill them, but it would also kill the foliage to which applied. There is no known means of protecting the grapes from the attacks of the original culprits, but by all means let us disseminate truthful knowledge, and especially protect the bees for the good they do to the entire community."

COMBINING BEEKEEPING AND FARMING.

BY PORTER C. WARD.

READ BEFORE THE TENNESSEE BEEKEEPERS' ASSOCIATION, JUNE 30, 1914.

General farming and beekeeping, to my mind, make a perfect combination. Beekeeping combined with fruit growing, poultry raising or almost any specialized farming would work to an advantage. But that about which I wish to speak is general farming and beekeeping, since I can say without boasting that I have had some success with the combination. The two can be worked together almost without conflict, and very much to the advantage of the farmer both for pleasure and profit.

I am a grower of tobacco, wheat, corn, hogs, and all the products

generally found on the average farm in this section, yet I find time to give my bees all the necessary attention and that with very little conflict as a rule. Many farmers have ideal locations for bees and could with very little trouble have one of the most delightful and healthful sweets for his own table, and with a little more attention and care could handle colonies enough to materially help out financially. Enough time is generally wasted around the village store, postoffice or blacksmith shop to attend to a number of colonies.

One of the greatest objections that the farmer has against beekeeping is that he cannot afford to waste any time "fussing" with swarms. He would be willing to keep bees if he could place a few colonies in his orchard without having the everlasting swarming. This difficulty has been largely overcome by the use of hives made for



Home Apiary of Porter Ward.

the production of extracted or bulk comb honey and by giving room and ventilation to the colonies at the proper time.

Preparation for his crop can be made on rainy days in the winter time. Supers need cleaning, extracting combs overhauled, frames prepared for the production of bulk comb honey. Supplies for the coming season ought to be ordered and they can be put together at odd times during the winter. Hives need to be prepared to care for swarms, for you will have some swarming in spite of everything that can be done. Supers can be hauled to outyards and stacked up ready to be put on for the hoped-for harvest.

The above is a general outline of the work that I do each winter. As some of you know, I practice general farming, and to make a success of beekeeping and farming I have to utilize every spare moment and of course I have no time to spend loafing around the village post-office or store. I find practically no conflict, the combination working

together almost perfectly. I have 114 colonies of bees and intend increasing to 160 the coming summer. This, with 275 acres of land, keeps me busy. Necessarily I must economize in every way possible that nothing be slighted.

But back to the preparation for the coming harvest. As above stated, everything that can possibly be done in the winter time, when farm work is a little slack, is given the necessary attention. In the spring all is in readiness and I can go about my general farm work with only an occasional glance at my bees, making sure that they have an abundance of stores. Nearer the honey flow, of course, bees require closer attention, but again we have very little conflict. I am up soon, directing my farm laborers for the day, looking after stock, etc., which takes my time until 8 or 9 o'clock; then I can be with my bees until about 3 p. m. And how little you will miss the time!



Out Yard of Porter Ward.

The village store, with its whittling crowd, may miss you, but it will be good for you financially and morally.

I produced something over 10,000 pounds of honey last year (1913), and all the help I had was what little I had my farm laborers do. Some help was necessary in hauling honey from outyards and in extracting. With this work with my bees I have successfully handled my farm. I put all my honey up in five-pound friction-top buckets, labeling each, and it sold readily at 15 cents a pound, or 75 cents a pail. This honey sold itself. Very little advertising was done. It was called for almost as fast as I could extract it from the combs.

There isn't a nicer combination than farming and beekeeping, and if you are a successful farmer and like bees and honey, try it. If you are not making good with your farm you have troubles enough without adding beekeeping to your already heavy responsibilities.

REPORT OF THE STATE INSPECTOR OF APIARIES.

To the Commissioner of Agriculture, T. F. Peck.

SIR: In compliance with section 10 of the Tennessee Apiary Law, I respectfully submit the following epitome of my official services for the year 1913.

The year 1913 was a very favorable one for the beekeepers of Tennessee, notwithstanding the severe drouth during the summer. The honey flow from white clover was an unusually heavy one over nearly the whole State, followed in many locations by a good fall flow from the aster bloom. The amount of honey and wax gathered can safely be estimated at \$300,000.00. The honey harvest was so great that most of the beekeepers are encouraged to increase their apiaries and many farmers are arranging to add beekeeping as a side line to their

**Apiary Inspection in Cumberland County.**

general farm work. About one farm in every nine have bees upon them; of the 250,000 farms in the State about 28,000 of them report beekeeping as a side line. The number of colonies in the State will approximate 200,000, which gives a valuation at only \$2.50 each of \$400,000.00. The great majority of these swarms, however, are kept in the old fashion box hives or "bee-gums." By transferring from these to the modern, scientific hive and keeping them after approved methods, the honey and wax returns could easily be brought up from \$225,000.00 to over \$1,000,000.00 annually.

The middle latitude of the State where extremes of temperature are seldom experienced, the varied and widespread honey-yielding flora, the abundant rainfall and the comparative freedom from the deadly foul brood diseases makes the outlook for Tennessee as a beekeeping State very flattering. Again, Tennessee is making rapid progress in her orchard and truck gardening industries, and in these

alone the honeybee is almost indispensable in the pollinization of fruit bloom. In this special work of carrying pollen the honeybee has a valuation greater than that of the honey harvest. The total annual value of this little insect to the people of Tennessee has been estimated to fall but little short of \$1,000,000.00. By education and development this valuation can easily be doubled and even more.

But much education is demanded to lead the people away from the old fashion, antiquated methods that result in no profit, to methods that make beekeeping worth while. To this end your Inspector of Apiaries has given much attention and labor. Lectures on practical beekeeping have been given during the year in over two-thirds of



Queen Breeding Yard of J. S. Banks, Liberty, Tenn.

freely. During the month of August alone work was done in fourteen of the counties northeast of Nashville, which necessitated a travel of at least 1,200 miles over all kinds of roads in sections where railroads have not gone. Lectures, demonstrations, inspections and collecting names and addresses of beekeeping people made up the daily work. Over 2,500 people were reached and left stimulated to better things.

During the year the correspondence with beekeeping people was about double that of the previous year. More and more are the beekeepers realizing that the State is ready to help them with their troubles, and that in beekeeping there is one of the most profitable side the counties and literature on modern methods has been distributed lines of farm life. This correspondence was encouraged by prompt replies and the suggestions of how greater profits grow out of "knowing how."

The reports of contagious bee diseases were surprisingly few. The State is blessed in having so little of the foul brood diseases. However, these diseases are in the State and will spread rapidly until the industry will be ruined if not kept in check. In my lectures, literature and correspondence I urged the people to report their troubles, and to the calls that came in I gave the needed attention. During the year inspection work was done in 40 apiaries containing all together over 1,500 colonies. Disease was found in 23 of these apiaries and the orthodox treatment instituted as the cases demanded. In each case instruction as to symptoms, treatment, precautions, etc., were given as a safeguard in the future. The brood diseases were found almost exclusively around the cities and larger towns. To these places the diseases must have been carried from diseased districts in the mar-



Queen Breeding Yard of Curd Walker, Jellico, Tenn.

keted honey. To control this source of infection is an unsolved problem. Careful inspections were given the queen breeding yards of the State, which necessitated trips that extended from Cocke County in East Tennessee to Shelby County in West Tennessee. I am pleased to report all the queen yards free of disease.

Ignorance and bee diseases are at the foundation of all the beekeeper's troubles and "bad luck." Educate him in better methods; show him how to recognize diseases; teach him how to treat and guard against them, and real progress will have been made. Inspection work is of prime importance, still it should be the gateway for that educational work that will lead to a general betterment of the beekeeping industry.

Respectfully submitted,

DR. J. S. WARD,

State Inspector of Apiaries.

BROOD DISEASES OF BEES.

BY DR. J. S. WARD, STATE INSPECTORS OF APIARIES.

There are three known diseases of the brood, two of them very contagious, namely, "American Foul Brood" and "European Foul Brood," while the third, called "pickled brood," or "Sacbrood," is an infectious disease, and if allowed to go without attention sometimes causes serious losses.

AMERICAN FOUL BROOD.

American Foul Brood is a disease caused by bacteria known to scientists as *Bacillus Larvae*. It reaches the healthy young larvae by means of infected food fed to them by the nurse bees. In most cases the larva dies *when nearly ready to seal up*, and most of the cells containing infected larvae are capped. The dead larva softens, settles to the lower side of the cell in a shapeless mass, at first *white or yellow*, changing to *coffee-color* and *brown*. At this stage it becomes

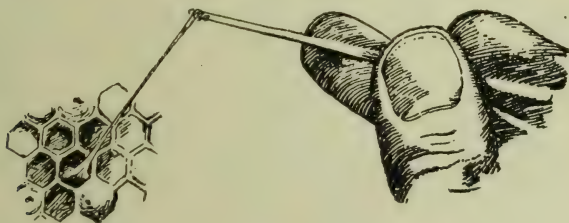


FIG. 3.—The ropiness of American foul brood. (Original.)

glutinous, so that if it is picked with a toothpick the contents will rope out half an inch or so when the pick is slowly withdrawn. It adheres to the cell so it cannot be lifted out entire. It has the odor of a poor quality of glue. When the larva dries it forms a tightly adhesive scale, of very dark brown color, which cannot be removed without tearing the cell wall.

"Pupae also may die of this disease, in which case they, too, dry down (fig. 2, *o*, *d*), become ropy, and have the characteristic odor and color. The tongue frequently adheres to the upper side wall, and often remains there even after the pupa has dried down to a scale. Younger unsealed larvae are sometimes affected. Usually the disease attacks only *worker brood*, but occasional cases are found in which queen and drone brood are diseased."—(*U. S. Dept. of Ag. Farmers' Bul.* 442.)

Where the infected larvae are capped the cappings turn a darker color and become flat or sunken; the workers, perceiving that something is wrong, usually start to tear off the capping, but, discovering the

condition of the contents, they generally leave it with a small perforation in the center until quite dry, then the capping is removed, and in time honey may be stored in the cells containing the scales of disease. The millions of disease spores then float out into the honey, which becomes a medium for carrying the disease to other healthy larvae by robbing, in the same or some other apiary. Some of the honey is also carried into the supers, to make room for alterations in the brood nest, and is marketed in the form of bottled or section honey. It goes into many homes, especially in towns and cities. The wooden sides of the sections, and many of the empty bottles, or

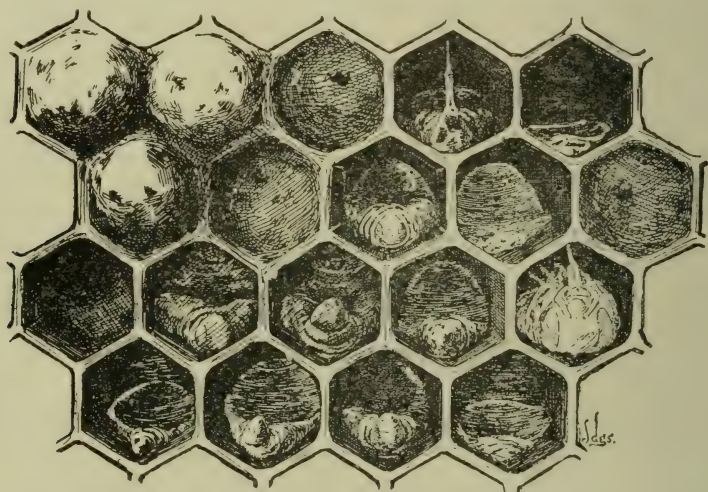


FIG. 2.—American foul brood; *a, b, f*, normal sealed cells; *c, j*, sunken cappings, showing perforations; *g*, sunken capping not perforated; *h, l, m, n, q, r*, larvæ affected by disease; *e, i, p, s*, scales formed from dried-down larvæ; *d, o*, pupæ affected by disease. Three times natural size. (Original.)

washings from them, are thrown out by housekeepers and cleaned up by bees of the neighborhood, and the disease is carried home to their healthy brood. This is why we find more disease in the apiaries around towns and cities than elsewhere.

TREATMENT.

The cause of American foul brood is found in a bacillus or micro-organism, which when once established is most easily transmitted in the honey. It develops and reproduces very rapidly. To be cured of this disease a colony must be *freed from all this infected brood*,

comb and honey. To do this *we simply take it away.* But in the operation some precautions are necessary. We must see that the colony will get healthy food as soon as the unhealthy food is taken away, and have means for building new comb at once. So the operation should be performed during a honey flow. The earlier the better, provided there is enough nectar to furnish the food. Treated early in the season the bees will have more time to build comb and store surplus. They may be treated later with equal success, but will have less time to gather surplus honey for winter stores, and may have to be fed. We must take precautions against starting robbing, or

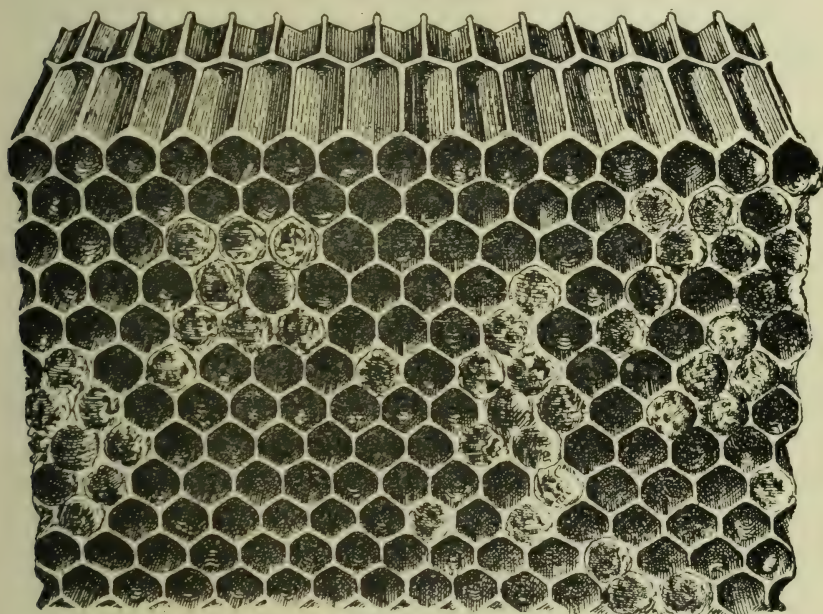


FIG. 4.—American foul-brood comb, showing irregular patches of sunken cappings and scales. The position of the comb indicates the best way to view the scales. (Original.)

causing the treated colony to scatter to other hives or swarm out, be lost, and carry infection to other places. So the operation should be performed in the evening when the bees are settling down for the night, and the entrance should be covered with queen-excluding metal to hold the queen in case of swarming out the next morning. A regular queen-excluder laid on the bottom board under the brood chamber will answer the latter purpose. Whenever bees are disturbed in their hives they will fill their honey sacs with honey from the comb. As this will happen when the hive is being treated, and some of this diseased honey might be stored in the new combs, it is necessary to

make them eat it before they can find a place to put it. To make sure of this not one bit of comb of any kind can be left in the hive. Even sheets of foundation are unsafe, as some cells can be so quickly drawn out enough to deposit a little infected honey. The hive must be quite empty so far as comb or foundation is concerned, except that a very narrow starter of foundation not more than one-half inch wide may be placed in the frames to indicate where the combs are to be built. Thus the diseased honey will be consumed in wax secretion before any of it can be deposited in the hive.

METHOD OF TREATMENT.

When there is a good honey flow on the colonies should first be prepared for treatment by removing from the hive every comb which does not contain brood. This will include all the super comb and probably two or more next the walls in the brood chamber. These must be put under cover immediately and destroyed as soon as possible. The remaining brood combs should be loosened and spread apart to facilitate rapid handling. When all colonies are thus prepared during the day it will be a short matter to finish the treatment in the evening.

When the bees have nearly stopped flying for the night each prepared colony is treated as follows: First remove it from its stand, then set in its place a clean, disinfected hive containing clean frames with one-half inch starters. If the queen is not clipped the entrance to this hive must be covered with queen-excluding metal. Now shake the bees from the combs of the old hive into the new; but if any fresh nectar flies out in shaking it will be necessary to brush instead of shaking, or make a runway to the hive of newspaper and shake the bees in front of the new hive. After the operation the soiled newspaper should be destroyed. In shaking in front of the hive the first one or two frames should be so shaken that the bees are thrown against the front of the hive, where they will quickly locate the entrance. Get these combs immediately under cover, and clean up very carefully any honey that may be around, so that robbers from healthy colonies cannot carry home disease.

When the diseased colonies are weak in bees, the bees of two or three should be put together into one clean hive so as to get a good sized colony with which to start the cure.

But in doing this diseased colonies must be united with their next-door neighbor, and not carried to another part of the apiary, as flying bees will be sure to return and may enter adjoining healthy colonies, carrying disease.

You have now made an artificial swarm of this colony. It must be given the conditions a new swarm likes, or it will leave and carry its disease to parts unknown, or perhaps into some healthy hive in the apiary. A new swarm likes plenty of ventilation and shade, and also plenty of clustering room. To satisfy this natural desire it is sometimes necessary to *place an empty hive under the one containing the starters* for a few days. This simple precaution will generally prevent the swarming out which so often happens in treating foul brood.

All combs from the supers as well as from the brood chamber of the diseased colony must be either burned or melted and boiled thoroughly before the wax is fit to use again. The honey that is removed is entirely unfit for bee feed and should be burned or buried deep enough to be out of the reach of any bees. This diseased honey could be saved, but it has very little value after the boiling required to disinfect it. It is absolutely safe for human consumption, but it is against the laws of many States to put such honey on the market, because of the danger of the empty receptacles being thrown out where the bees may have access to them and thus cause a new outbreak of the disease.

On the *third* evening after the first operation the starters and what combs have been built *must all be removed* by shaking or brushing off the bees as before. This time the bees should be given full sheets of foundation in a clean hive, and the cure is completed.

If directions have been followed carefully and thoroughly the treatment should be successful. To make sure, however, the brood must be examined again in about *three weeks* and again the following season. If the disease reappears in any colonies they can be treated again.

SAVING BROOD.

Brood from badly diseased colonies is of no value, and dangerous, and should be burned, buried or otherwise destroyed at once. Brood from colonies having only a few cells diseased may be placed over an average colony slightly diseased, and the queen caged. In ten days treat as given above.

SAVING COMB.

It is never safe to use super-combs that have been on diseased colonies. Even though they may appear white and clean, germs of the disease are apt to lurk in them from year to year. To melt these down is no serious loss, as the wax will more than make foundation for new ones.

CAVING FRAMES.

Frames may be cleaned by boiling in water for an hour, but this frequently causes them to warp badly.

SAVING HIVES.

Hives which have formerly contained diseased colonies, or in which diseased combs have been stored or carried, should be burned over inside with a gasoline or oil torch.

FALL TREATMENT.

If the disease is discovered late in the season, and the colony is still strong, *leave it until November*, take the diseased combs away, and supply honey from a healthy colony, in full sealed combs. *Be sure that the combs are all sealed, and that they are from a colony which has no disease.*

If the colony is not strong enough to be worth this treatment it should be destroyed at once, as one great source of spread is the spring robbing out of combs left by the winter death of such colonies.

EUROPEAN FOUL BROOD.

The best description of this disease which has been published is found in U. S. Department of Agriculture Farmers' Bulletin 442, "The Treatment of Bee Diseases," by E. F. Phillips, Ph.D. It is as follows: "European foul brood was formerly called 'black brood,' or 'New York bee disease.' The name 'black brood' was a poor one, for the color of the dead brood is rarely black, or even very dark brown. European foul brood usually attacks the larva at an earlier stage of its development than American foul brood, and while it is still *curled up at the base* of the cell (Fig. 4, *r*). A small percentage of larvae dies after capping, but sometimes quite young larvae are attacked (Fig. 4, *e, m*). Sunken and perforated cappings are sometimes observed, just as in American foul brood (Fig. 2, *c, g, j*). The earliest indication of the disease is a slight yellow or gray discoloration and uneasy movement of the larva in the cell. The larva loses its well-rounded, opaque appearance and becomes slightly translucent, so that the tracheae may become prominent (Fig. 4, *b*), giving the larva a clearly segmented appearance. The larva is usually flattened against the base of the cell, but may turn so that the ends of the larva are to the rear of the cell (Fig. 4, *p*), or may fall away from the base (Fig. 4, *e, g, l*). Later the color changes to a decided yellow or gray and the translucency is lost (Fig. 4, *q, h*). The yellow color may be taken as the

chief characteristic of this disease. The dead larva appears as a moist, somewhat collapsed mass, giving the appearance of being melted. When the remains have become almost dry (Fig. 4, *c*), the tracheae sometimes become conspicuous again, this time by retaining their shape, while the rest of the body content dries around them. Finally all that is left of the larva is a grayish-brown scale against the base of the cell (Fig. 4, *f*, *h*), or a shapeless mass on the lower side wall if the larva did not retain its normal position (Fig. 4, *n*, *o*). Very few scales are black. The scales are *not adhesive*, but are *easily removed*, and the bees carry out a great many in their efforts to clean house.

"Decaying larvae which have died of this disease are usually not ropy as in American foul brood, but a slight ropiness is sometimes

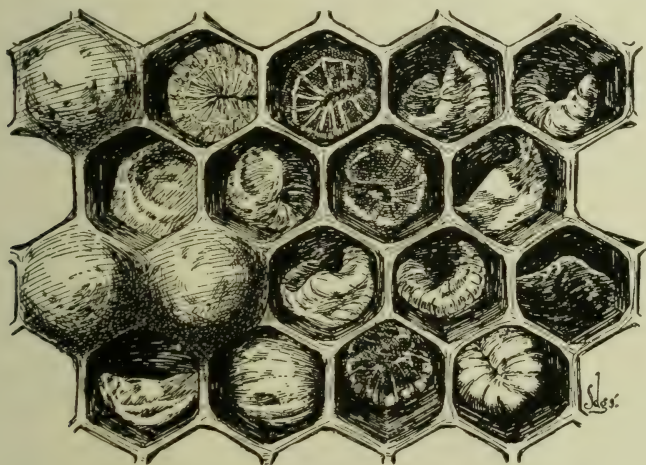


FIG. 5.—European foul brood: *a*, *j*, *k*, normal sealed cells, *b*, *c*, *d*, *e*, *g*, *i*, *l*, *m*, *p*, *q*, larvae affected by disease; *r*, normal larva at age attacked by disease; *f*, *h*, *n*, *o*, dried-down larvae or scales. Three times natural size.
(Original.)

observed. There is usually little odor in European foul brood, but sometimes a sour odor is present, which reminds one of yeast fermentation. This disease attacks drone and queen larvae almost as quickly as those of the workers. The tendency of this disease to attack queen larvae is a serious drawback in treatment. Frequently the bees of a diseased colony attempt to supersede their queen, but the larvae in the queen cells often die, leaving the colony hopelessly queenless. The colony is thus depleted very rapidly.

"European foul brood is *more destructive during the spring and early summer* than at other times, *often entirely disappearing* during late summer and autumn, or during a heavy honey flow. Italian bees seem to be better able to resist the ravages of this disease than any other race. The disease at times spreads with startling rapidity and is most destructive. Where it is prevalent a considerably larger percentage of colonies is affected than is usual for American foul brood. This disease is very variable in its symptoms and other manifestations and is often a puzzle to the beekeeper."

TREATMENT.

This disease is now thought to be transmitted through the queen and brood. Pure-bred heather-colored Italian bees are almost immune to European foul brood. Therefore the best plan yet found is to first make the disease colony queenless, then after twenty-one days give the colony a young, laying Italian queen or a ripe queen cell of Italian stock. The bees, anxious to have clean combs for brood, will take out the dead brood, clean up the cell, and soon there will be full combs of healthy brood.

SACBROOD.

A disease slightly resembling foul brood is called by some "Starved Brood," and by others "Pickle Brood." It has recently been described and named "Sacbrood" by Dr. White of U. S. Department of Agriculture. The most positive difference in the diagnosis of this disease is the absence of ropiness and of the pot-glue smell which is always found in American foul brood.

In sacbrood the larva decays *from the inside*, leaving the skin tough and in its natural shape; in European foul brood or American foul brood the skin of the larva softens as the contents become glutinous and all the natural wrinkles become smooth as the mass settles to the lower side of the cell. In sacbrood the larva often dries up so as to become loose in the cell and fall out when the comb is inverted. In American foul brood it always cements fast to the lower cell wall so it cannot be removed without tearing the cell. European foul brood attacks the larva generally at an earlier stage in its existence than sacbrood.

"Sacbrood is an infectious disease of the brood of bees caused by an infectious agent so small or of such a nature that it will pass through the pores of a Berkefeld filter."

TREATMENT.

Requeening with a vigorous young Italian queen will effect a cure.

**TENNESSEE BEEKEEPERS' ASSOCIATION,
NASHVILLE, JANUARY 30.**

BY J. M. BUCHANAN, SECRETARY.

A most interesting and instructive meeting of the Tennessee Beekeepers' Association was held at Nashville on January 30, with perhaps the best attendance in the history of the association. Papers and addresses on vital topics, together with lively discussions, took up the entire day.

The opening address was by the President, Mr. J. M. Davis, of Spring Hill, whose subject was "The Bee as Man's Coworker." He gave an outline of the history of beekeeping, and showed the value of the work of the bees, both in the production of honey and wax, and in their aid in the fertilization of fruit-bloom. He pointed out the fact that the apricot is the only stone fruit that is not dependent on the bees or other insects for the proper pollination of its blossoms.

"Fancy Comb Honey in Spite of Foul Brood" was the subject of a talk by L. F. Watkins, of Nashville. Mr. Watkins told how, in addition to managing a farm of 200 acres, he had cleaned up an apiary of nearly 100 colonies badly affected with American foul brood, and at the same time had produced a good crop of fancy comb honey.

In a discussion on marketing honey a number of good points were brought out, and emphasis was given to the need of proper grading and packing, and also to the advantage of holding up the price. It was shown that it is folly to spend time and labor producing a crop of nice honey and then selling for whatever the merchant offers. There is a demand for all our products in the local markets, and at good prices.

Another discussion was in regard to controlling swarming. It seems that most of the members just "let 'em swarm," as that seems to be the easiest way to "control" swarming. It was pointed out that, in the production of comb honey, with prolonged and intermittent flows such as we have, there is no satisfactory method of prevention of swarming. It is, perhaps, as well to allow them to swarm once, and then throw the strength of the colony to the swarm. When working for extracted honey it is a much easier matter, as was stated by B. G. Davis, as the use of young queens, plenty of storage room, particularly of drawn combs, and good ventilation, would go a long way toward solving the problem.

Mrs. Mira Tandy, of Nashville, gave an address on "Beekeeping as a Supplemental Course in the Public Schools." She favored the or-

ganization of beekeeping clubs among the boys and girls, after the manner of the boys' corn clubs. Such clubs would create an interest in beekeeping, and she thought would help to keep the boys and girls on the farm.

Dr. J. S. Ward, State Apiary Inspector, gave a review of the inspection work for the past season. He said there was a marked improvement in the foul-brood situation in the State, and that with proper care the disease could be kept under control. Dr. Ward spoke of the symptoms, and gave the methods of treatment recommended for the disease. He showed that the introduction of a hardy strain of Italian stock is essential in the cure of European foul brood. As for sacbrood, he thought a change of queens all that was needed, although this had not been thoroughly tested. He said he had seen whole apiaries wiped out by sacbrood.

A paper by Porter Ward, of Elkton, Ky., was read, in which he told of producing ten thousand pounds of honey from 100 colonies, besides running a farm of 150 acres. This was bulk comb honey, and, by the way, this seems to be quite a popular way of packing honey in this State.

The following officers were elected for the ensuing year: President, T. J. Ayers, Cedar Hill; Vice-President, W. B. Romine, Pulaski; Secretary, J. M. Buchanan, Franklin. Dr. J. S. Ward and J. M. Buchanan were selected as delegates to the national convention at St. Louis.

After the convention adjourned, an hour was spent in a general social chat, which was enjoyed by all.

SOME NECTAR AND POLLEN-BEARING PLANTS OF TENNESSEE.

BY J. M. BUCHANAN, FORMER STATE INSPECTOR OF APIARIES.

It is essential that the beekeeper have some knowledge of the flora of his locality in order to get the best results from his beekeeping operations. He should know when to expect a honey-flow, and be able to tell with some certainty how long a flow will last, and what quality of honey he is likely to get from a certain source. Then he will know when to make his increase, when to expect swarms, when to put on supers, etc.

The character of the honey-producing flora and the date of bloom depend on the soil, the season, and the altitude. A list of plants that will be found in one place may not apply at all to a location not very far distant.

In Tennessee there is great variation in soil and in altitude, the latter ranging from about 300 feet in the Mississippi Valley to over 6,000 feet in the mountains of East Tennessee; hence it will be impossible to give the exact dates of bloom of the plants in this list. It would seem, from a casual reading of the list, that we had a continual flow from early in the spring until frost, but such is not the case for any given locality. This will be better understood from the following general summary of conditions:

The Tennessee River crosses the State twice, and the Cumberland makes a long curve through the central section, and in these valleys white and alsike clovers, and, in many places, black locust, form the principal source of surplus honey. On the ridges and tablelands of the central and eastern sections, the honey is from poplar, sourwood, and wild flowers of many species. On the plains of the western part of the State, and in the Mississippi Valley cotton gives the greatest surplus.

The following list is by no means complete, although it gives the most important honey and pollen-bearing plants of the State, with their approximate date of blooming.

Soft maple, *Acer rubrum*, February, March. Pollen and nectar. First help to brood-rearing. Valleys.

Elm, *Ulmus americana*, March. Pollen.

Sugar maple, *Acer saccharinum*, March, April. Sweet sap; nectar, pollen.

Dandelion, *Taraxacum officinalis*, February to June. Nectar.

Peach, *Amigdalus persica*, March, April. Nectar, pollen.

Plum, *Prunus domesticus*, April. Some nectar and pollen.

Turnip, *Brassica rapa*, April. Sometimes gives surplus where grown for seed.

Redbud, *Cercis canadensis*, March, April. Nectar, pollen.

Apple, *Malus*. Nectar, pollen. Valuable for brood-rearing.

Black locust, *Robinia pseudacacia*, April, May. Good yielder of fine honey; slow to granulate.

Yellow-wood, *Virgilia lutea*, May. Some surplus where abundant.

Poplar, *Liriodendron tulipifera*, May. Heavy yielder. Honey amber, but good flavor.

Alsike clover, *Trifolium hybridum*, May to July. Almost equal to white clover. Central and east.

White clover, *Trifolium repens*, May, June. Principal source in central and eastern valleys. Honey white.

Persimmon, *Diospiros virginiana*, May. Honey dark. Uplands.

Linden, *Tilia americana*, July. Honey white, good yielder. Central and eastern valleys.

Sourwood, *Oxydendron arboreum*, July. Uplands. Good honey, almost entirely free from granulation.

Cow-pea, *Vigna sinensis*, July, August. Some honey, mainly from extra floral glands.

Milkweed, *Asclepias*, several species, July, August. Some honey; sticky pollen.

Horsemint, *Monarda clinopodioides*, July. Some surplus in western and central valleys.

Indian corn, *Zea mays*, July, August. Pollen and some nectar.

Ragweed, *Ambrosia aptera*, July, August. Heavy bearer of pollen.

Smartweed, *Persicaria mite*, August. Light-amber honey of good flavor. Lowlands.

Sumach, *Rhus capolina*, August. Some surplus. Uplands.

Buckbush, *Symphoricarpos vulgaris*, August. Sometimes gives surplus. Honey, amber.

Cotton, *Gossypium herbaceum*, July to September. Good yielder in western counties.

Bitterweed, *Helenium tenuifolium*, August, September. Amber honey, very bitter. West.

Holly, *Ilex glabra*, July, August. Honey, dark. West.

Boneset, *Eupatorium perfolia*, August. Yields heavily along northern border of the State.

Laurel, *Kalmia latifolia*, July, August. Eastern mountains.

Goldenrod, *Solidago*, several species. September. Pollen.

Aster, *Aster*, several species. September, October. Honey, amber; strong in flavor, quick to granulate. Good for winter stores.

WOOD AND LUMBER.

A cord of wood contains 128 cubic feet. To ascertain how many cords there are in a pile of wood, multiply the length by the height, and that by the width, and divide the product by 128.

One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and matching.

To measure round timber, take the girth in inches at both large and small ends, add them, divide by 2, which gives the mean girth; then multiply the length in feet by the square of one-fourth of the mean girth and the product will be the contents in cubic feet. This rule is commonly adopted, and gives four-fifths of the true contents, one-fifth being allowed to the purchaser for waste in sawing.

One thousand laths will cover 70 yards of surface, and 11 pounds of lath nails will nail them on. Eight bushels of good lime, 16 bushels of sand and 1 bushel of hair will make enough good mortar to plaster 100 square yards.

Scaly Legs—Apply vaseline to affected parts, and after twenty-four hours soak in warm, soapy water. Repeat treatment until cured.

STOCK RAISING IN TENNESSEE.

The Agricultural Department at Washington, in bulletins sent to the public, shows much apprehension for the effect of the drouth that has prevailed in the West is going to have on the supply of beef cattle. The fear is apparent that there is going to be a material increase in the price of meat. The increase in meat prices has been so continuous and so persistent for several years that the public will not be surprised at further advances, and being thus promptly advised of what to expect, the people may make such preparations as may be indicated for meeting the emergency.

It is noted that the information has been received in the South with a tone of hopefulness, at least in the newspaper press. For years the Southern States have been neglecting the feature of cattle raising, once a profitable part of the farmer's annual output. A widespread call is being made upon the Southern farmer that he again become a cattle raiser.

Commissioner of Agriculture Peck, who has given the subject much study, is sure that the raising of stock in Tennessee, included in which is the raising of beef cattle and sheep, is one of the manifestly profitable openings the farmer has for making money. Tennessee has large areas of waste lands that properly cultivated could in a few years be made into rich grazing lands. This State is subject to no prolonged drouths and its climatic conditions are altogether favorable to cattle raising. The diseases to which stock is susceptible may be easily controlled with the proper care and attention, and the only drawback lies in the apparent indifference of the farmer to the means and methods, so easily accessible, for redeeming his worn-out lands for the purposes of pasture.

Experiments with alfalfa are going forward in many sections, and while results have not been as immediately satisfactory as were hoped for, there isn't the slightest reason for doubting that with proper care, patience and determination, it may be made one of the staple crops of this region.

At any rate, the conditions offer the people of Eastern Tennessee a magnificent opening for increasing the money value of their holdings by a generous experiment in the production of meat cattle.—*Chattanooga Times*.

Bowel Trouble in Chicks—Well-boiled rice mixed with a little charcoal will often check this complaint.

CAUSE OF MANY FAILURES.

The Illinois station gives among the causes of failure in the poultry business the following:

Endeavoring to keep too many fowls where room for one only can be obtained; that is saving in expenses by cheapening cost of houses and space.

Buying fowls from other farms and thus bringing disease and lice into the flocks.

Overfeeding, the fowls being supplied with greater abundance under the supposition, the more feed the more eggs.

Cold draughts over the fowls at night, with a view to supplying fresh air, when the temperature is low.

Wasting time with sick fowls instead of destroying all birds that can not be cured quickly.

CROP REPORT FOR JUNE.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., July 1, 1914.**

Reports from crop correspondents throughout the State for the crop month ending June 20 indicate that at that time a large section of the State was badly in need of rain, pastures had been badly damaged, and the hay crop was cut very short. Since the mailing of the reports by correspondents there has been rain in some sections where it was badly needed by early corn and gardens.

A fine wheat crop has been harvested in the State, the reports showing a percentage of 88, which would indicate an average production to the acre in the State of about 18 or 19 bushels. The production per acre will be reported on next month.

The corn crop had not suffered to any extent from the dry weather, but had reached that stage where it was beginning to need rain. The corn crop in the State will depend to a great extent on general rains in the next few days.

Cotton is also needing rain and the condition of the crop in the cotton section of the State at the present time is only fair.

Tobacco will also be a short crop this year on account of lack of seasonable weather for planting. The acreage is about the same as last year.

The acreage in Irish potatoes for the first crop is below normal. and the yield will be cut short on account of dry weather. The acreage in sweet potatoes will be about up to the average.

Apples and peaches will show a larger yield than last year. Grapes also indicate a fine yield.

Peanuts show indications of an average yield. The condition of alfalfa is fair wherever a stand has been obtained.

The general condition of live stock in the State is good. Hog cholera is quite prevalent, but not more so than usual at this season of the year. Many farmers in different sections of the State have protected their hogs by the use of anti-hog cholera serum, and the use of serum is on the increase, and it is probable that the loss of hogs by this disease will be considerably lessened in Tennessee next year. Pink-eye in cattle appears to be unusually prevalent for this early in the season. A few isolated outbreaks of black leg have been reported, and one outbreak of anthrax in Shelby County last month.

Below is given the summary, for comparison, of the reports of the Department for the month of June, 1913, and 1914:

	1913. Per Cent.	1914. Per Cent.
Cotton, acreage	93	95
Cotton, condition	81	77
Wheat, estimated yield (bushels).....	17	19
Garden, condition	82	65
Oats, estimated yield (bushels).....	27	18
Young clover, condition.....	69	66
Meadow grasses, condition.....	73	63
Millet, acreage	80	70
Corn, acreage	92	89
Corn, condition	83	82
Tobacco, acreage	86	65
Tobacco, condition	76	65
Apples, condition	55	74
Peaches, condition	50	67
Grapes, condition	84	81
Stock Peas, acreage	83	76
Irish Potatoes, acreage	84	84
Irish Potatoes, condition	83	64
Sweet Potatoes, acreage	88	80
Tomatoes, acreage	86	81
Tomatoes, condition	82	75
Peanuts, acreage	77	72
Peanuts, condition	79	77
Live Stock, condition	89	88
Alfalfa, condition	87	79

JUNE CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT.	COUNTY.															Wheat—yield, per cent.	Garden—condition.	Oats—yield, per cent.	Young Clover—condition.	Grasses—condition.	Millet—acreage.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Tobacco—condition.	Apples—condition.	Peaches—condition.	Grapes—condition.	Stock Peas—acreage.	Irish Potatoes—acreage.	Irish Potatoes—condition.	Sweet Potatoes—acreage.	Tomatoes—acreage.	Tomatoes—condition.	Peanuts—acreage.	Peanuts—condition.	Live Stock—condition.	Alfalfa—condition.			
		Cotton—acreage.	Cotton—condition.	Wheat—yield, per cent.	Garden—condition.	Oats—yield, per cent.	Young Clover—condition.	Grasses—condition.	Millet—acreage.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Tobacco—condition.	Apples—condition.	Peaches—condition.	Grapes—condition.	Stock Peas—acreage.	Irish Potatoes—acreage.	Irish Potatoes—condition.	Sweet Potatoes—acreage.	Tomatoes—acreage.	Tomatoes—condition.	Peanuts—acreage.	Peanuts—condition.	Live Stock—condition.	Alfalfa—condition.															
A	Lake	100	85	60	75	80	80	80	75	85	80	80	85	85	95	90	100	100	70	90	100	90	..	..	80	85	90	80	90	90	80	85	..	..					
	Obion	100	75	50	75	80	60	70	100	100	85	85	60	70	85	100	100	100	50	80	100	90	..	..	80	75	90	70	95	100	100	75	..	..					
	Dyer	100	85	50	90	85	60	85	100	100	95	95	50	60	75	85	85	90	80	100	100	100	100	100	100	100	100	80	90	100	100	100	100	100	75	..					
	Laurel	95	75	50	90	85	75	85	100	100	70	100	100	75	60	65	100	90	90	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	98	..				
	Tipton	100	75	65	100	85	75	85	25	100	85	85	85	60	65	100	100	90	75	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	98	..			
B	Shelby	100	75	..	85	75	75	85	..	100	85	85	60	65	100	100	100	85	80	90	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	95	..		
	Weakley	100	85	75	75	50	80	60	85	95	85	40	50	60	60	80	100	85	90	90	70	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	95	..		
	Gibson	90	85	90	85	75	75	80	85	95	90	..	..	60	40	80	90	90	70	95	95	70	75	70	95	70	95	70	95	70	95	70	95	70	95	100	..			
	Crockett	90	75	50	60	60	60	50	100	100	75	100	100	50	50	40	40	90	50	40	60	75	50	60	75	50	40	60	75	50	40	60	75	50	40	60	75	100	..		
	Madison	90	80	90	100	95	100	100	95	100	100	100	95	60	40	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	95	..
C	Haywood	90	50	60	60	75	80	65	..	90	60	70	70	25	75	75	80	75	80	75	75	60	75	60	75	60	75	60	75	60	75	60	75	60	75	60	75	75	100	..	
	Hardeman	90	75	45	80	80	80	50	75	90	85	40	40	25	40	85	90	75	85	50	65	80	75	85	80	75	85	80	75	85	80	75	85	80	75	85	80	95	..		
	Fayette	95	60	85	90	90	90	85	75	100	20	40	85	85	85	100	90	75	85	50	65	80	75	85	80	75	85	80	75	85	80	75	85	80	75	85	80	95	..		
	Henry	95	70	85	85	90	90	85	75	100	20	40	85	85	85	100	90	75	85	50	65	80	75	85	80	75	85	80	75	85	80	75	85	80	75	85	80	95	..		
	Carroll	90	70	85	85	55	55	60	70	70	70	..	..	60	40	80	90	100	100	30	35	50	75	60	75	60	75	60	75	60	75	60	75	60	75	60	75	100	..	
Upland Section of West Tennessee.	Henderson	100	90	90	90	90	80	85	..	100	90	80	80	100	100	80	80	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	85	..
	Chester	100	90	75	75	75	75	75	100	100	90	..	..	25	25	75	65	80	30	30	35	50	75	60	75	60	75	60	75	60	75	60	75	60	75	60	75	100	..	
	McNairy	75	70	35	65	65	50	45	90	85	85	85	85	90	100	100	50	100	50	75	60	75	60	75	60	75	60	75	60	75	60	75	60	75	60	75	90	..	
	Benton	100	75	60	60	60	50	50	75	100	85	85	85	90	100	100	50	100	50	75	60	75	60	75	60	75	60	75	60	75	60	75	60	75	60	75	90	..	
	Decatur	100	75	60	60	60	50	50	75	100	85	85	85	90	100	100	50	100	50	75	60	75	60	75	60	75	60	75	60	75	60	75	60	75	60	75	90	..	
Western Section of Middle Tennessee.	Hardin	85	..	75	75	75	60	60	60	75	60	60	
	Ferry	90	80	70	70	70	60	60	100	100	90	80	80	100	40	80	100	100	80	85	75	70	50	80	90	80	70	50	80	70	50	80	70	50	80	70	50	80	80	..	
	Humphreys	90	80	85	85	80	85	80	..	100	90	85	70	85	100	80	80	85	75	80	50	90	90	80	70	50	80	70	50	80	70	50	80	70	50	80	80	..	
	Houston	95	85	80	85	80	..	100	90	85	70	85	100	80	80	85	75	80	50	90	90	80	70	50	80	70	50	80	70	50	80	70	50	80	80	..	
	Stewart	90	85	75	75	90	60	60	95	95	85	60	60	80	80	80	80	100	100	70	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	80	..
Western Section of Middle Tennessee.	Montgomery	90	85	90	90	90	90	100	75	100	90	60	60	70	60	75	60	50	50	90	100	60	80	90	90	80	70	50	80	70	50	80	70	50	80	70	50	80	80	..	
	Robertson	90	85	90	90	90	90	100	75	100	90	60	60	70	60	75	60	50	50	90	100	60	80	90	90	80	70	50	80	70	50	80	70	50	80	70	50	80	80	..	
	Cheatham	90	70	50	90	75	90	60	100	75	100	90	60	60	70	60	75	60	50	40	100	50	90	100	60	80	70	50	80	70	50	80	70	50	80	70	50	80	80	..	
	Dickson	100	80	75	50	50	50	75	100	100	100	50	100	100	55	75	75	70	65	70	60	50	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	90	..
	Hickman	100	85	60	65	60	60	60	60	70	70	55	55	65	75	70	75	70	65	70	60	50	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	90	..
Lawrence	Lewis	..	..	90	90	50	60	70	100	100	90	..	..	100	75	75	75	75	90	90	60	50	90	90	80	70	50	80	70	50	80	70	50	80	70	50	80	80	..	
	Wayne	..	..	100	50	50	60	70	100	100	90	..	..	100	75	75	75	75	90	90	60	50	90	90	80	70	50	80	70	50	80	70	50	80	70	50	80	80	..	

Central Section of
Middle Tennessee.

Eastern Section of
Middle Tennessee.

Cumberland Plateau.

JUNE CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Cotton—acreage.	Cotton—condition.	Wheat—yield, per cent.	Garden—condition.	Oats—yield, per cent.	Young Clover—condition.	Grasses—condition.	Millet—acreage.	Corn—acreage.	Corn—condition.	Tobacco—acreage.	Tobacco—condition.	Apples—condition.	Peaches—condition.	Grapes—condition.	Stock Peas—acreage.	Irish Potatoes—acreage.	Irish Potatoes—condition.	Sweet Potatoes—acreage.	Tomatoes—acreage.	Tomatoes—condition.	Peanuts—acreage.	Peanuts—condition.	Live Stock—condition.	Alfalfa—condition.
G	Claiborne	...	...	85	60	50	50	60	100	75	...	...	...	60	25	50	...	75	40	40	65	50	...	...	60	...
	Hancock	...	...	90	75	50	60	50	...	75	...	...	...	70	80	80	75	90	70	80	90	80	...	...	90	...
	Anderson	...	...	80	80	85	75	100	100	75	...	100	55	90	60	95	100	100	85	100	75	70	...	...	80	...
	Grainger	...	...	95	80	80	90	85	95	85	...	...	50	85	75	90	50	...	...	...	90	...	...	...	...	...
	Union	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Knox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Khea	...	...	...	75	...	50	40	90	80	...	...	...	50	40	50	80	80	75	80	...	50	...	...	85	75
	Roane	...	...	...	60	...	40	30	100	90	...	...	...	75	85	...	85	100	75	80	...	...	...	...	85	...
	Landon	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	McMinn	...	...	75	80	75	70	50	85	80	...	...	...	85	85	90	90	70	70	95	80	...	...	...	75	...
	Meigs	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Kradley	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hamilton	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	James	...	...	100	90	80	75	80	75	100	95	...	...	90	100	95	100	75	85	60	...	...	...	...	100	...
H	Johnson	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Sullivan	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Carter	...	...	80	80	75	80	80	80	100	80	...	...	75	50	100	80	100	80	100	100	90	...	...	80	80
	Hawkins	...	...	100	75	80	80	80	100	100	...	...	...	90	100	100	100	100	75	...	...	...	...	...	...	95
	Washington	...	...	100	50	50	50	50	75	100	85	50	50	50	80	80	75	100	60	75	100	50	...	...	...	80
	Unicoi	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Greene	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hamben	...	...	85	90	60	50	50	75	90	90	...	...	60	50	90	65	60	50	80	90	85	...	...	85	80
	Jefferson	...	...	15	25	15	80	75	90	100	90	...	...	50	100	100	80	...	50	...	...	...	...	...	...	80
	Cooke	...	...	100	75	70	85	65	...	...	...	...	...	50	40	85	85	100	65	85	80	...	...	...	95	95
	Sevier	...	...	...	...	...	...	...	...	...	...	...	...	90	90	...	...	...	...	...	...	...	...	...	...	70
	Blount	...	...	85	80	40	70	40	85	95	70	...	75	85	85	85	80	80	80	...	90	...	...	...	...	...
	Monroe	...	...	85	95	60	70	70	95	100	100	...	...	...	...	...	100	40	...	...	100	60	...	...	...	...
	Polk	...	...	75	75	...	...	40	75	80	...	...	...	75	80	80	60	40	30	...	...	...	...	...	...	75
Mountain Section of East Tennessee.	...	95	77	88	67	65	66	63	70	89	82	65	65	74	67	81	76	84	64	80	81	75	72	77	88	79

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IN THIS ISSUE:

The Agricultural Special.

Soil—The Farmer's Working Capital.

The Smith-Lever Law. Making and Feeding of Silage.

Keeping Records of the Dairy Herd.

A Real Country Life School.

Education of the Tennessee Farmer.

July Crop Report.



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TOUR OF THE AGRICULTURAL SPECIAL.

On Monday morning, July 15, the Agricultural Special, operated by the Department of Agriculture and the railroads of Tennessee, began its 6,000-mile journey over the State, carrying the gospel of better farming to every section of Tennessee to be reached by the iron horse.

With nine cars crowded with equipment showing advanced methods in farming, education, sanitation, etc., and with a corps of lecturers and demonstrators necessary to explain to the large crowds to be met, the Special pulled out of the Tennessee Central yards at Nashville, making the first stop at Ashland City, on the Clarksville end of the Tennessee Central. A large and enthusiastic crowd greeted the train at the first stop, and this has been the experience at practically every point made by the Special since it has been on the road.

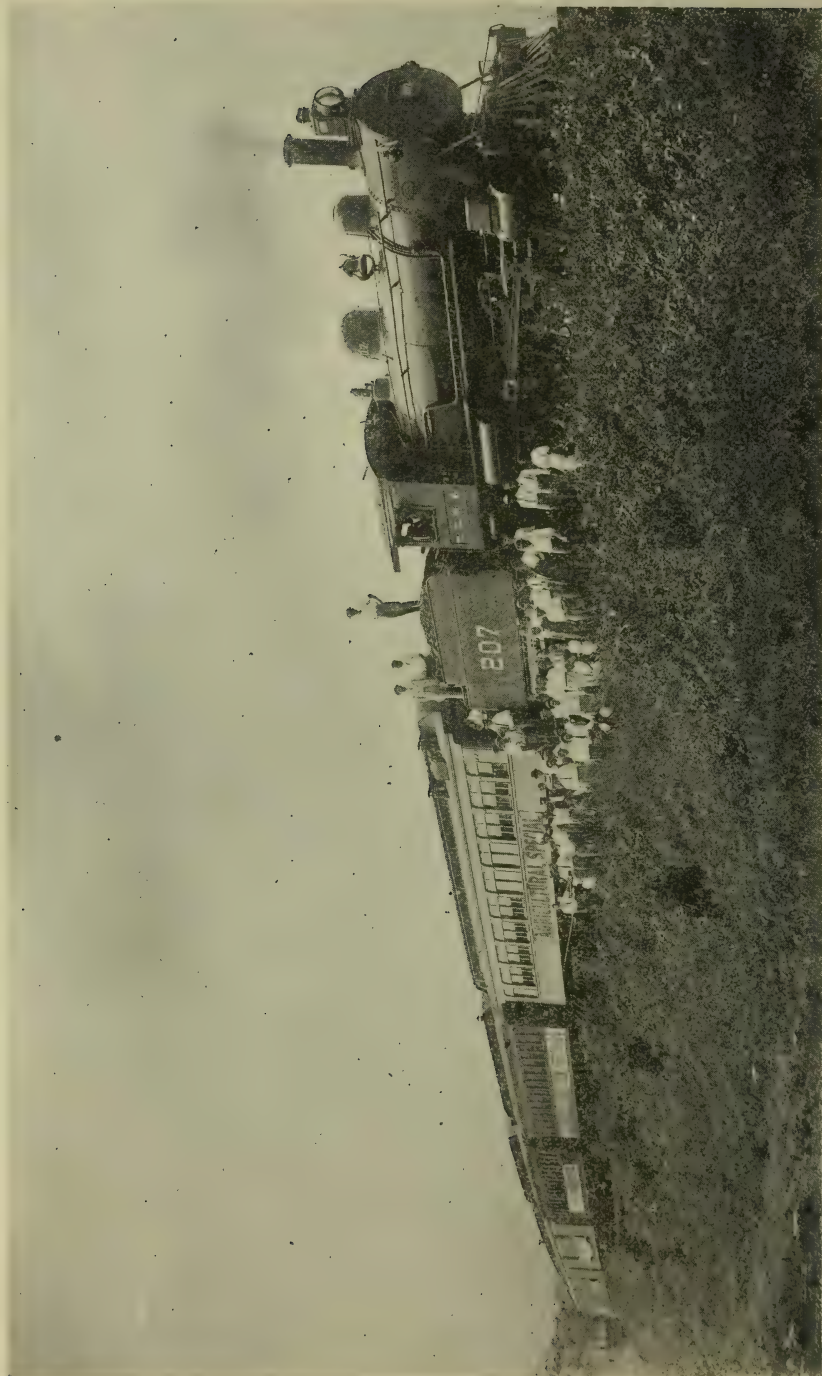
Up to the first of August the train had been on the road fifteen working days, had made about eighty-five stops, and had been viewed by about ten thousand people each day.

Five days were devoted to the towns and stations along the Tennessee Central Railroad, two to the Queen & Crescent, seven to the Southern Railway and branch lines in East Tennessee, and the last day of July to the Carolina, Clinchfield & Ohio. On the first day of August the train goes back to the Southern for one day, then to the Knoxville, Sevierville & Eastern for one day, then to the Louisville & Nashville in East Tennessee for four days, then to the Southern between Knoxville and Chattanooga for three days, and is turned over to the Nashville, Chattanooga & St. Louis, which road will handle the Special for fifteen days through Middle and West Tennessee. The Southern will handle the train again in West Tennessee for one day, after which the Mobile & Ohio, the Illinois Central, the Birmingham & Northwestern, will take it in turn over their lines, and deliver it on September 8 to the Louisville & Nashville Railroad, which will handle it for nine days in West and Middle Tennessee, concluding the tour on September 17, on the Lewisburg & Northern branch, which has recently been thrown open for traffic.

The train was originally scheduled to conclude the tour on September 15, but two days have been added on the new road, on which the following stations will be made:

September 16 (Wednesday).

Brentwood	9:00 a.m. to 10:00 a.m.
College Grove	10:20 a.m. to 12:30 p.m.
Chapel Hill	1:00 p.m. to 3:00 p.m.
Cowden	3:30 p.m. to 5:30 p.m.
Lewisburg (night meeting).	



The Agricultural Special.

September 17 (Thursday).

Cornersville	9:00 a.m. to 11:00 a.m.
Frankewing	11:35 a.m. to 1:35 p.m.
Wheelerton	2:00 p.m. to 3:30 p.m.
Ardmore	4:00 p.m. to 5:30 p.m.

The train is under the direction of Commissioner of Agriculture T. F. Peck, who is assisted by other members of his department and by officials of the Departments of Health, Education and Pure Food and Drugs. The list of those accompanying the train was published in the July number of Tennessee Agriculture.

Some illustrations of the train are presented in this issue.

VALUE OF CONSECUTIVE CROP RECORDS.

Cost of crop production records to be of the greatest value should cover a consecutive term of years. Only by this means can an average cost of production be determined. Very few crops are either highly profitable or ruinously unprofitable every year. Most crops have their good and their bad years from the standpoint of profits, and only by records extending over a term of years can the relative profits or losses of the fat and lean years be compared and the normal or average cost of production and profit determined. To illustrate this, figures obtained by complete cost records for five years on a general farm in western New York are shown in the table below. This farm practices a three-year rotation of beans, wheat, and clover, which is a customary rotation in this locality. The figures show that none of these crops made a profit or caused a loss every year of the five over which the records extended. It will be easily seen that no single year's records would have given a safe index of the relative cost and profit of all these crops and of the rotation.

Profit or Loss per Acre.

Year	—Beans—		—Wheat—		—Clover—		—Rotation—	
	Profit	Loss	Profit	Loss	Profit	Loss	Profit	Loss
1909	\$10.30	.....	\$ 8.73	.....	.....	\$ 1.71	\$ 5.77	.....
1910	13.85	.....	4.40	.....	\$ 1.75	.....	6.77	.....
1911 ....	.....	\$13.29	.....	\$ 5.08	2.73	.....	.....	\$ 5.21
1912	3.98	.....	.....	10.38	13.40	.....	2.33	.....
1913 ....	.....	6.85	12.73	.....	.03	.....	1.97	.....
Average	1.60	.....	2.08	.....	3.24	.....	2.30	.....

The profits shown are strictly net, all interest, taxes, and general expense of every nature having been apportioned to the productive farm enterprises including these crops.

SOIL, FARMERS' WORKING CAPITAL.

BY T. F. PECK,
COMMISSIONER OF AGRICULTURE.



In previous talks to farmers we have discussed "Soils and Methods for Improving Them," but the subject is so important, and one that so few understand as they should, we feel justified in emphasizing this question of soil building. The soil is the farmer's working capital—his workshop—and his success depends upon the fertility and good condition of his soil.

All soil is made up of pulverized rock and vegetable matter. The rock contains the mineral matter that the plant feeds on. This mineral matter must be unlocked,

either by nature or some other means, before the plant can make use of it. Before this mineral matter can enter into the plant as plant food it must become dissolved by the water and taken up by the water. This can only be done after nature or some other agency has unlocked it.

Nature unlocks plant food very slowly, and the business of the farmer is to hasten this process so that the growing plant can be provided for. One of the means to this end is introducing vegetable matter into the soil. When this vegetable matter rots in the soil it ferments and starts what is called humic acid, which eats away at these mineral substances and puts them in a condition so water will dissolve them. This is the cheapest way of unlocking the mineral plant foods of the soil.

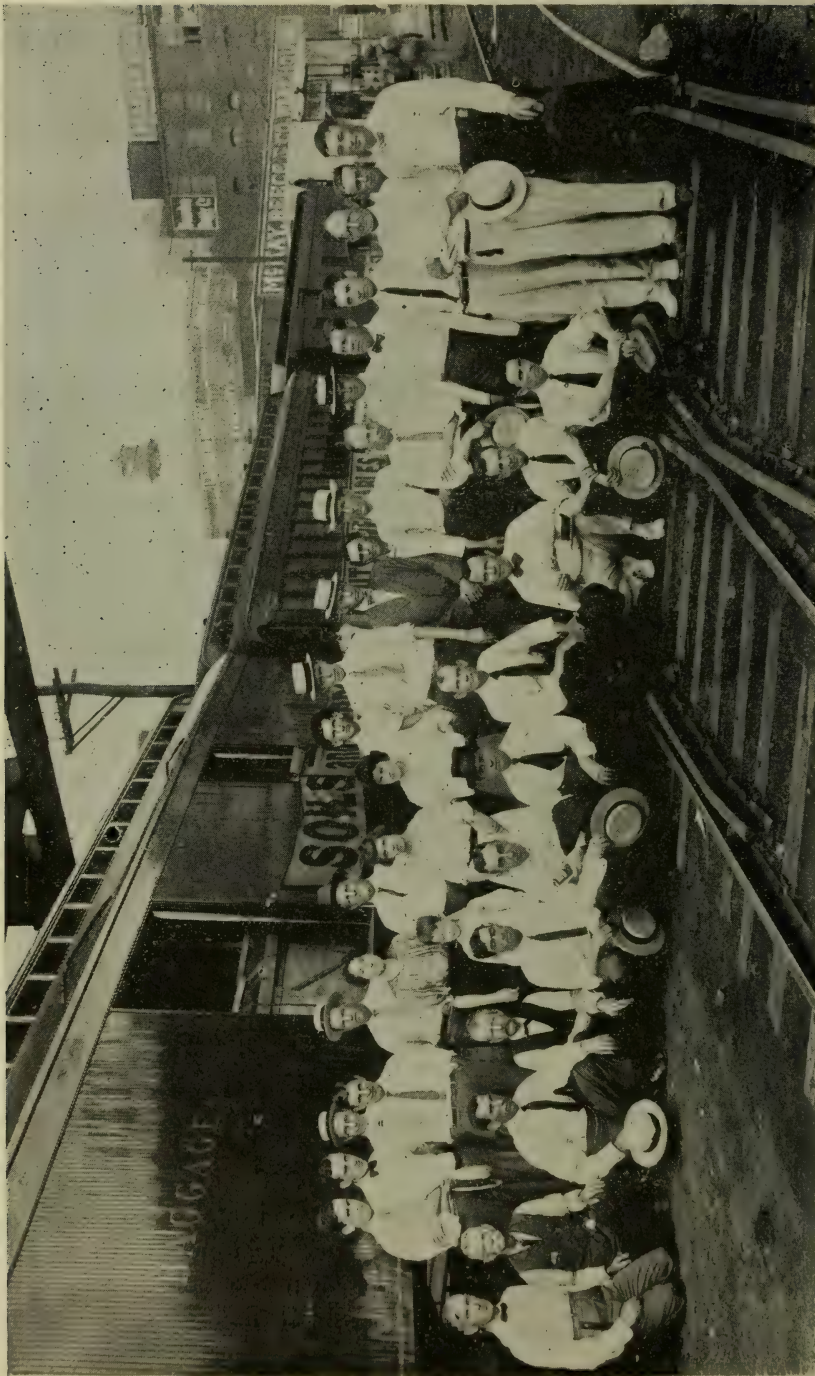
This same vegetable matter, while it is unlocking the mineral plant foods, is doing other work fully as important. This plant food can only be taken up by water, and unless there is sufficient moisture in the soil the plant cannot hold moisture in suspension. Adding decayed vegetable matter (humus) to the soil increases its capacity largely for holding water in suspension where the plant can get it. The late grow-

ing crops, like corn or potatoes, are cut short often for lack of soil moisture. Fully 80 per cent of the moisture the corn plant makes use of is taken up after the corn begins to tassel. This, ordinarily, is the driest time of the whole season, and the plant will suffer unless the farmer has taken time by the forelock and filled his soil with vegetable matter and has done good tillage. Many of the soils that fail to respond after being tilled for some years are still rich in plant foods that are lying dormant and are waiting to be unlocked by the introduction of vegetable matter.

Nor is this all that rotting vegetable matter will do for soils. A plant must have, in addition to plant food and water, warmth and air. When vegetable matter rots in the soil it separates the soil particles, letting in the warm air warmed by sunshine. One can easily test this. Put a thermometer in a soil that is filled with rotting vegetable matter in the spring of the year and then put it in a soil devoid of vegetable matter and note the difference. It will be found that the thermometer will register several degrees of heat in the first named soil. All sod fields dry off and heat up earlier than old fields. This is very important, especially where a crop of corn is growing. An abundance of vegetable matter in a soil will push a corn crop ten days ahead of a crop growing on a field lacking in this important element.

Another lift that vegetable matter gives the soil is in letting in more air in the soil so that the soil bacteria can better work. Unless a soil is in the proper condition for these soil bacteria to work and assist in placing food at the disposal of the plants, the growing crop must suffer. Scientists tell us that in a spoonful of earth there should be more than a million soil bacteria. These can only work where air is supplied. Then the more air they have the better they can work. In other words, a soil filled with rotting vegetable matter makes an excellent medium for the soil bacteria to multiply and work in. In short, many soils that fail to respond with paying crops are really lacking vegetable matter rather than plant food. How can this vegetable matter be supplied? By better use of the farm manure, growing of legumes and rotation of crops.

Forty pounds of blue grass, three pounds of white clover and three pounds of solid red top make a good lawn mixture. The white clover and red top grow quickly and are gradually crowded out by the blue grass, which makes a much better lawn. Be sure that the lawn is finely raked and the soil is in the very finest condition of tilth before sowing any seed.



Part of force accompanying Agricultural Special, which began a two-months' tour of Tennessee July 15.

GOVERNORS ASKED TO TAKE FIRST STEP TO PUT SMITH-LEVER AGRICULTURAL EXTENSION LAW INTO EFFECT.

The Secretary of Agriculture at Washington has written to the Governors of all the States asking that they designate the college or colleges to which the funds provided by the Smith-Lever cooperative agricultural extension law are to go. This is the first step in putting into effect this act approved by the President May 8, which provides for the granting of Federal funds to the State agricultural colleges to aid in diffusing among the people useful and practical information on subjects relating to agriculture and home economics, and to encourage the application of the same.

The conditions of the act are that each State must duplicate the money above \$10,000 a year appropriated to it by the Federal Government. The money raised by the State may come from the State, county, college, local authority, or individual contributions from within the State, for the maintenance of cooperative agricultural extension work. The Governor of each State, in the interval until the legislature meets, is called upon to designate the agricultural college or colleges to which the Federal funds are to be paid.

The act provides that each State in which an agricultural college is designated shall receive as a basic fund from the Federal Government \$10,000 annually without additional appropriation from the State. The act then makes the provision for additional appropriations to be distributed in the proportion which the rural population of each State bears to the total rural population of all the States, as determined by the next preceding census. To share in these additional funds, however, the State, either through State, county, college, or local funds, or from individual contributions from within the State, must duplicate the additional amounts granted by the Federal Government for the maintenance of the cooperative agricultural extension work provided for in this act.

The Federal money to which each State becomes entitled will be paid in equal semiannual payments on the first day of July and January of each year.

The additional appropriations provided for in the act are as follows: \$600,000 for the fiscal year following that in which the basic appropriation first becomes available. This \$600,000 will then be increased by \$500,000 for each succeeding year thereafter for seven years until the total additional sum appropriated is \$4,100,000 annually. This sum and the annual basic appropriation of \$480,000 will then be available each year thereafter.

The act, after providing that pending the inauguration of the new work the farm management and farmers' cooperative demonstration work shall not be discontinued, defines the uses to which the Federal moneys shall be put as follows:

"That cooperative agricultural extension work shall consist of the giving of instruction and practical demonstrations in agriculture and home economics to persons not attending or resident in said colleges in the several communities, and imparting to such persons information on said subjects through field demonstrations, publications, and otherwise; and this work shall be carried on in such manner as may be mutually agreed upon by the Secretary of Agriculture and the State agricultural college or colleges receiving the benefits of this act."

The act provides that no appropriation of Federal money shall be applied directly or indirectly to the purchase, erection, preservation, or repair of any building or buildings, or the purchase or rental of land, or in college-course teaching, lectures in colleges, promoting agricultural trains, or any other purpose not specified in this act.

Not more than five per cent of each annual appropriation may be applied to the printing and distribution of publications, which means that ninety-five per cent of the appropriation must be devoted to the giving of instruction and practical demonstrations to persons not attending the colleges.

The act also provides that where any of the Federal money so granted to a State shall be diminished or lost, or be misapplied, the State, until it so replaces the money, cannot receive further Federal appropriations.

The following table shows the schedule of appropriations under the act:

Fiscal year	Basic fund \$10,000 to each state	Additional Federal appropriation to be distributed in proportion to rural population	Total Federal appropriation
1914-15	\$480,000	.....	.....
1915-16	480,000	\$ 600,000	\$1,080,000
1916-17	480,000	1,100,000	1,580,000
1917-18	480,000	1,600,000	2,080,000
1918-19	480,000	2,100,000	2,580,000
1919-20	480,000	2,600,000	3,080,000
1920-21	480,000	3,100,000	3,580,000
1921-22	480,000	3,600,000	4,080,000
1922-23	480,000	4,100,000	4,580,000
1923 and there- after	480,000	4,100,000	4,580,000

As the States must provide a like amount for this cooperative agricultural extension work, it means that twice these amounts will be available for this work if each State takes up its full quota.

THE MAKING AND FEEDING OF SILAGE.

Silage during the last three decades has come into general use throughout the United States, especially in those regions where the dairy industry has reached its greatest development. Silage is universally recognized as a good and cheap feed for farm stock, and particularly so for cattle and sheep, are the observations made in Farmers' Bulletin 578 of the United States Department of Agriculture.

Silage is the best and cheapest form in which a succulent feed can be provided for winter use, continues the bulletin. An acre of grain can be placed in the silo at a cost not exceeding that of shock-



Interior View of Live Stock Car, Agricultural Special.

ing, husking, grinding and shredding. Crops can be put in the silo during weather that cannot be used in making hay or curing fodder, which is an important consideration in some localities.

A given amount of corn in the form of silage will produce more milk than the same amount when shocked and dried. There is less waste in feeding silage than in feeding fodder. Good silage properly fed is all consumed, and in addition very palatable. Like other succulent feeds, it has a beneficial effect upon the digestive organs, and some stock can be kept on a given area of land when it is the basis of the ration.

On account of the smaller cost for labor, silage can be used for supplementing pastures more economically than can soiling crops, unless only a small amount of supplementary feed is required. Converting the corn crop into silage clears the land sooner than if the corn crop is shocked and husked, and because of these advantages, silage, in the general opinion of dairy farmers, has increased milk production per cow and has increased the profits per acre.

CORN.

In all parts of the United States where the silo has come into general use the principal silage crop is corn. One reason for this is that ordinarily corn will produce more food material to the acre than any other crop which can be grown. It is more easily harvested and put into the silo than any of the hay crops, such as clover, cow-peas, or alfalfa.

Furthermore, corn makes an excellent quality of silage. The legumes, such as clover and alfalfa, are liable to rot unless special care is taken to pack the silage thoroughly and force the air out. The only objection which has been raised concerning corn silage is the fact that it contains insufficient protein fully to meet the requirements of animals to which it may be fed. The best variety of corn to plant is that which will mature and yield the largest amount of grain to the acre, since the grain is the most valuable part of the corn plant. The variety commonly raised in any particular locality for grain will also be the most satisfactory to grow for silage.

CULTIVATION AND YIELD.

In some sections it is a common practice to plant the corn a little thicker when raised for silage than for grain. Weeds should be kept out, or they will be cut with the corn and may impair the quality of the silage. The amount of silage that can be obtained from an acre of corn will vary from four to twenty tons or more. A 50-bushel per acre crop of corn will yield about eight to twelve tons of silage per acre, depending upon the amount of foliage and stalk that accompanies the ear. Southern varieties of corn as a rule carry a larger proportion of the plant in the form of stalk and leaves than do the northern-grown varieties. Corn should be harvested for the silo at about the same time that it is harvested for fodder.

SORGHUMS.

Sorghums, both saccharine and nonsaccharine, are readily made into silage. On account of their superiority to corn as drouth-resist-

ing crops they are more commonly grown in those regions of the West where the rainfall is too light or irregular for a good growth of corn. It is important that the sorghums be harvested at the proper stage of maturity if the best results are to be secured. A mixture of corn and sorghum has proved satisfactory in some localities where the rainfall was so variable as to make the corn crop uncertain.

CLOVER.

Clover can be used successfully as a silage crop, yielding a palatable product high in protein, but it is preferable to make it into hay, or the silage made from clover, as from other legumes, has an objectionable odor, necessitating particular care in feeding to avoid tainting the milk. It does not pack so well as corn, so great care should be exercised in the tramping of the silage at the time of filling, and the



Machinery Car of Agricultural Special.

depth of the silo should also receive particular attention. Clover should be chopped before siloing as a matter of convenience in feeding and also to secure more thorough packing, although it can be placed in the silo without chopping. Clover should be harvested when in full bloom and some of the first heads are dead.

COWPEAS, ALFALFA, AND SOY BEANS.

Cowpeas, alfalfa, and soy beans can be successfully made into silage by exercising the same precautions as with clover. They should be cut at the same time as for haymaking. However, it is ordinarily preferable, as with clover, to make them into hay rather than silage. The fermentations which take place in silage made of legumes cause

a greater loss of nutritive material than with corn silage. Corn husks and pea vines from canning factories, beet pulp, and other by-products, are also used in certain localities for filling the silo.

Corn for the silo can be cut either by hand or by machine. Hand cutting is practiced on farms where the amount of corn to be harvested is so small as to make the expense of purchasing a corn harvester too great to justify its use. Hand cutting is slow and laborious, and there are probably few localities now where the purchase of a harvester would not be a profitable investment.

There are on the market several makes of silage cutters that will give satisfaction. The capacity of the machine to be purchased is an important consideration which should not be overlooked. Many persons make the mistake of getting a cutter which is too small, thus making the operation of filling the silo very slow and interfering with the continuous employment of the entire force of men. It is better to get a machine large enough so that everyone will be able to keep busy all the time. The larger cutters are equipped with self-feeders, a labor-saving device which the smaller sizes lack.

The usual length of cutting varies from one-half to one inch. The latter is considered a little too long, since pieces of this length will neither pack so closely in the silo nor be so completely consumed when fed as will the shorter lengths. On the other hand, the longer the pieces the more rapidly can the corn be run through the cutter.

In case the corn has become too dry or ripe before it is put into the silo, water should be added to supply the deficiency of moisture necessary to make the silage pack properly. Unless it is well packed the silage will "firefang" or deteriorate through the growth of mold. Enough water should be added to restore the moisture content of the corn to what it would be if cut at the proper stage. The water may be added by running directly into the silo by means of a hose or by running through the blower. It is claimed that by running it into the blower the water is more thoroughly mixed with the cut corn.

AVERAGE PERIOD OF GESTATION.

The period of gestation in animals varies considerably, but the following is an average period based on a long series of observations:

Ass	12 months	Goat	5 months
Bitch	9 weeks	Mare	11 months
Cat	8 weeks	Sheep	5 months
Cow	9 months	Pig	3½ months
Guinea pig	65 days	Rabbit	30 days

KEEPING RECORDS OF THE DAIRY HERD.

ADDRESS OF D. C. YOUNG, OF SWEETWATER, TENN., BEFORE THE EAST TENNESSEE FARMERS' CONVENTION AT KNOXVILLE.

There is no more important part of the dairy work than the keeping of records. This is seriously objected to by some people on the ground that it takes so much time and labor. It will look like a big job unless it is done regularly and kept up, but if it is followed up from day to day and the records kept up all the time it is not so much work. As a matter of fact, keeping records as to the breeding of cattle, especially thoroughbred cattle for registration, is an enormous job unless it is kept up and tab kept of it constantly and from day to day.

The keeping of these records is very important. In the first place it



Exhibit of Sheaf Grain, Agricultural Special.

enables the dairyman to know what he is doing, the kind of cattle he is raising if he raises his own, and the kind of cows he is buying if he buys. To do otherwise is like a man who would take raw material of any kind in a factory and convert it into the manufactured article without having any idea of the cost of manufacture.

The cow is a machine that converts food and water into milk, cream and butter. She takes rough material and converts it into the most palatable and choice food for man, so that the question of the kind of machinery and the best way of handling and manipulating that machin-

ery is the question that confronts the dairyman. If he keeps no records and no track of the business he is like a sailor at sea without guide or compass. If we desire to sell a cow we can simply guess or estimate that she is such and such a cow. She looks well and gives a good quantity of milk, but to say how much milk she will give or how much butter she will make is a mere guess or estimate.

No man who has a herd in which he grows or develops any of his calves but that he will find himself sooner or later overstocked, and he must of necessity sell some of his cows or some of his calves, and in either case the records are of vast importance to him. I have frequently made the remark, and I am sure it is true, that the registration record of a calf is worth more to the owner of the calf than the calf itself. That is to say, the calf with the registration certificate will bring two dollars to where it would bring one without it. And that is true of the keeping of milk records as well. If a dairyman is keeping a record of what his cows are doing he is enabled to cull out his poor cows and let them go out either for beef or to some buyer who is not particular for dairy purposes.

In every herd there is a best and a poorest cow. If a man has a record and a buyer comes along who wants the best and wants to pay the price, he will know what he is buying and the dairyman will know what he is selling, and neither will be disappointed. This is also true in selling calves; if you take up the records of your calves and look at the dams and the sires, you can hand these records to the buyer and he can look over them and satisfy himself which he wants and whether he can afford to pay the price asked.

I have had occasion in the last few years to visit some of the best herds in the land, and in making prices, the dairyman who was on to his job would ask twice or three times as much for one calf as he would for another, when there was not a dollar's difference in their appearance. The reason of this was the record behind them; one had the breeding and the other did not. And without these records they would have been priced alike. The man would not have known what he was selling or the buyer what he was buying.

If a dairyman finds that he has a cow or a number of cows in his barn that are boarders or that are simply making but little profit, the only thing to do is to get rid of them. But without records he would go ahead and work along and keep all the cows and wonder why he was not making money, when the only reason is that he is traveling in the dark. As I remarked in regard to the calves, oftentimes the prettiest cow in the herd is possibly the poorest producer in the herd. While we

like to combine beauty and value, yet simply looking pretty doesn't add anything to the bank account, and the cow that the dairyman wants is the cow that will produce the milk and make the butter.

I recall an instance that happened several years ago in my own herd: The dairyman complained that a certain cow in the herd was not giving enough milk to justify keeping her. I said to him, "Do you know how much butter she is making?" and he replied that he did not. Then I said, "Churn her milk and see what she is doing." He came to me in the next two or three days amazed, and saying that if all the cows in the herd were doing as well as that one our output would be doubled; he believed she was producing as much butter as any cow in the barn. I mention this to show how we grope in the dark.

It is also very important to keep tab of the feed. A great many dairymen feed blindly. They don't know whether the feed is a good balanced ration or simply something that will keep the cow going.



Bee Exhibit on Agricultural Special.

But when you commence working up the records and keeping a record of the milk and butter, it is then easy to keep a record of the feed also.

There is no necessity of weighing out every feed to a cow, but have a measure and weigh the measure and know exactly what it weighs and then feed by the measure. There are some feeds, of course, that we can't get absolutely at the price, like roughness, silage, grass, etc..

but we can make a reasonable estimate of all these, so we can know practically to a cent what profit a cow is making or what she is losing to her owner, or whether she is striking even.

Frequently we will find a cow that we specially prize and hate to see go out of the herd because of her beauty, gentleness, etc., is not paying her way, and we will retest and try to see some way if we are not mistaken; but if it is found that she is not making any profit there is only one thing for the sane dairyman to do, and that is to let her go. And as I said when I started out, the question of the time and labor it takes to keep the records is a small matter compared with the value of the record to the dairyman, and it will take but a few minutes each day if it is handled promptly each day.

I find that keeping records of the registered herd in order to be able to register them without trouble and worry, the matter must be kept up all the time. When a calf is dropped if the proper mark or tag is put on it so that you can unquestionably keep track of it and that mark, together with the name of the sire and dam, date dropped, etc., is put on the books right at the time there is no more trouble about it. You then, when you are ready to register, simply make out the application and send it in with the price and it is no trouble. I have had quite a bit of worry and trouble trying to assist my neighbors in working up their records, and it was always because they had neglected to put down the data at the proper time. They had just put it off and tried to keep it in their memory until it had passed out of their minds.

There is no more important matter connected with the dairy work than the keeping of proper records, and the Government and the Southern Railway both deserve much credit for the assistance that they are giving the dairyman through their valuable agents to establish this custom and system of work. It simply puts the dairyman on the same footing with the merchant who keeps his books and his invoices and knows all the time whether he is making or losing money. Why should not the farmer and the dairyman be business men the same as the merchant, the banker and the manufacturer. When this custom is established and the dairyman gets to running his business on a business basis he will be amazed at how he got along at all before he tried this plan.

On the question of keeping records for registering stock, I would suggest to dairymen, having tried it myself, that an ear tag or a tattoo mark or some sort of a mark is essential for the proper keeping of records. This mark or number should be put on the calf when it is only a few days old so as to make no mistake about it. Then when

that ear mark is put on the book with the date it is dropped, the name of the sire and dam, you have a complete record of the data necessary for registration. Then when the registration certificate is returned the ear tag number can be put on that, and if a registered herd book is kept, put it on the herd book as well. Then the whole matter is before you.

In keeping my records I put the data first on a daily scratch book that I have on my desk and it is carried from that to a second book called my breeding book, and from there to the herd register, so if I miss it in one I hope to catch it in another. I don't doubt that a great many of the old dairymen and breeders will have a better plan than this, but I merely mention this as being a fairly good plan from my viewpoint.

FARRAGUT SCHOOL—REAL COUNTRY LIFE SCHOOL.

The following interesting description and history of Farragut School, at Concord, Tenn., written by Ewing Galloway, appeared in a recent number of Collier's Weekly:

Back in 1902 a number of farmers in the vicinity of Concord village, in Knox County, Tennessee, got tired of seeing their children given training that started them toward business or professional careers in towns or cities, and made up their minds to establish, if possible, a school that would fit boys and girls for life in their own community. Book learning was all right—the more the better—but scholarship in literature and the sciences was not enough. They wanted their boys trained in practical agriculture and horticulture, and their daughters in rural domestic science.

FAMOUS EDUCATORS HELP.

They talked the matter over among themselves, and when they got ready to devise definite plans they called in such men as Charles W. Dabney, then president of the University of Tennessee and now president of the University of Cincinnati; Philander P. Claxton, at that time professor of education at the University of Tennessee, now United States Commissioner of Education; J. D. Eggleston, who afterward became president of the Virginia Polytechnic Institute, and Wallace Buttrick, executive secretary of the General Education Board, New York City. When the plans were agreed upon Mr. Eggleston made a personal canvass of the district and helped some of the local citizens raise \$5,000 by subscription, which amount was doubled by a donation from the General Education Board. The University of Tennessee was interested in the success of the institution, because it

wanted to be instrumental in establishing a school that might serve as a model for rural communities throughout the South and be an object lesson to students at the university who intended to become teachers.

An incorporated district board of trustees bought a farm of twelve acres near the intersection of two pikes a mile and a half from Concord, and built a wooden house of six rooms and an assembly hall. They converted the old building which stood near by into a cottage for the principal, and erected a good barn to be used by the school. The institution, known as the Farragut School, was to be a combination primary and high school. The courses of study provided for were similar to those in the usual country school of this size, with



Interior View of Soils and Crop Car, Agricultural Special.

modifications to suit the particular needs of the community. The school was opened in February, 1904, and its equipment was gradually improved. Many people of the community looked upon it as an experiment at the start, but it wasn't long before all their doubts about its success were changed to certainties.

INSPIRED BY FIRE LOSS.

Their loyalty was proved when, in March, 1906, the building and all the fixtures were destroyed by fire.

The destruction of the building made the patrons more ambitious

than ever. They found temporary quarters for the school, collected the insurance money, which amounted to \$3,500, raised a substantial sum by subscription, borrowed \$4,500, and erected a two-story brick building with basement at a cost of \$12,000. A water system and other modern equipments ran the total cost up to \$17,000.

EQUIPMENTS ARE OF THE BEST.

Besides the usual class rooms, there are rooms for household economics and manual training, and a large laboratory for physics, chemistry, botany and agriculture. The home economics room is equipped with a large range, three tables, a modern kitchen cabinet, a dining table, a fireless cooker, and all the necessary dishes and utensils. There is also a sewing machine, and the room is used by the girls' sewing classes. The manual training room is the kind you would find in an up-to-date city school. The boys and girls have separate lunch rooms, which also serve as play rooms when the weather is bad.

The school has a \$3,000 water system which is supplied from a spring by means of a double-acting ram propelled by the current of a creek. There are two large tanks in the attic of the building and water is piped as far as the principal's residence and a public drinking fountain and a watering trough for horses on the pike. Each of the main floors has two drinking fountains and there is one in each of the lunch rooms. The laboratory and kitchen are equipped with sinks and in the basement there are modern shower baths. Tanks connected with the furnace supply hot water the year round. The building is drained by a sewer which empties into the creek at a safe distance.

The school recently leased eight acres of land adjoining its own tract. The school lot is divided into two equal parts. The six acres about the buildings are used as playgrounds, the other six for farm and garden demonstration purposes. The rented ground is used to grow the larger field products. The school has an up-to-date poultry yard and keeps a fine thoroughbred mare for breeding purposes. A janitor and farm laborer is hired by the year.

DIVERSIFICATION IS THE IDEA.

All the agricultural work is purely demonstrative. The school follows experiments made by State officials and the Department of Agriculture. The demonstrations are made on small plats, and the principal, Adams Phillips, who is a Bachelor of Agricultural Science, lays special emphasis upon soil fertilization and crop rotation. He believes that one of the remedies for poor agriculture in most of the country is diversification, and teaches Farragut boys accordingly.

Both boys and girls are taught vegetable gardening. The girls take great pride in garden cultivation and in canning. Some of them have won valuable prizes in the last two or three years.

The primary department now has about 150 pupils and the high school about 90. The tuition is free to resident pupils; those from outside the county pay \$3 a month. The course in agriculture is not compulsory, but 90 per cent of the high school pupils take it. The girls substitute domestic science for part of the agricultural work.

COVERING CAPACITY OF SHINGLES.

Average size of shingles—4x16 inches—is taken as a basis of calculation.

100 sq. ft. will require, laid 4 inches to the weather.....900

100 sq. ft. will require, laid 4½ inches to the weather.....800

100 sq. ft. will require, laid 5 inches to the weather.....720

Three and one-half pounds of four-penny nails are required for laying 1,000 shingles.

5 to 10 per cent should be added to these figures for waste and shrtage.

TENNESSEE FAIR DATES FOR 1914.

POSTOFFICE	COUNTY	DATE	SECRETARY
Alexandria	DeKalb	Sept. 3- 5	Rob Roy.
Carthage	Smith	Sept. 10-12	S. M. Corley.
Celina	Clay	Sept. 8-11	W. F. Brown.
Cookeville	Putnam	Aug. 27-29	A. P. Barnes.
Deer Lodge	Morgan	Sept. 22-25	T. F. Hayworth.
Dresden	Weakley	Oct. 14-17	C. B. Brasfield.
Dyersburg	Dyer	Sept. 29-Oct. 3...	F. D. Haleb.
Gallatin	Lincoln	Aug. 26-28	F. M. Bledsoe.
Humboldt	Sumner	Aug. 27-29	W. Y. Allen.
Jacksboro	Gibson	Sept. 15-18	C. W. Rooks.
Fayetteville	Anderson	Sept. 23-25	H. C. Cox.
Jackson	Madison	Oct. 5-10	W. F. Barry.
Kingston	Roane	Sept. 15-18	Sam R. Sparks.
Memphis (Tri-State)	Shelby	Sept. 26-Oct. 3...	F. D. Fuller.
Morristown	Hamblen	Oct. 6- 8	R. F. Taylor.
Murfreesboro	Rutherford ..	Sept. 9-11	B. B. Kerr.
Nashville (State) ...	Davidson	Sept. 21-26	J. W. Russwurm.
Newport	Cocke	Oct. 13-15	J. M. Jones.
Paris	Henry	Sept. 20-Oct. 3...	R. H. Hudson.
Rome	Smith	Aug. 20-22	A. T. Williams.
Selmer	McNairy	Oct. 20-23	W. K. Abernathy.
Spring City	Rhea & Meigs	Sept. 22-25	J. R. Fischeffer.
Shelbyville	Bedford	Sept. 2- 4	W. E. Gant.
Sweetwater	Monroe	Sept. 29-Oct. 2...	J. F. Childress.
Union City	Obion	Sept. 9-12	J. W. Woosley.
Winchester	Franklin	Sept. 1- 4	J. F. Vaughan.

THE EDUCATION OF THE TENNESSEE FARMER.

ADDRESS AT THE EAST TENNESSEE FARMERS' CONVENTION, BY WM. R. BOURNE, STATE HIGH SCHOOL INSPECTOR.

The education of the Tennessee farmer does not demand a special consideration when compared with other farmers of other States. As a farmer his problem is the universal one, and the solution of it can be made only in terms of the definite statement. The child of the farmer finds his place in a universal scheme of education alongside of the child of the lawyer, doctor, merchant and minister. His training during the



Interior View of Health Car, Agricultural Special.

early years must be substantially the same and should consist of the best of instruction to bring him into the inheritance of the race.

The fundamental facts of life and training belong to all and differentiation must come later when the period of active production begins. A boy in the third, fourth or fifth grade is not the object of vocational care, and until this period is reached for the different children of our several sections of country, the child must be filled with the fundamental facts of all life as they underlie all phases of activity. This paper is not to determine when either differentiation is made or vocational oversight asserted. The farmer boy is no peculiar object of education in the early years, but the recipient of the fundamental facts of all races and times.

First: The farmer's education must be on the basis of manhood, laid deep in the principles of character inspired by efficient thinking. The backbone of the country must rest beneath a thinking skull and the responsible farmer of history and song must become the responsive landowner who knows his place in this age of industrial struggle. It is not enough that the farmer knows the proper way to plant his crops, but his reach should know the relation of these crops to his community, to the country and to the sum total of human happiness. If the mere growing things is the *summum bonum* of farming, then it is blind and needs no intelligence to direct; but if the matter of living on the farm is related to every other work of the world, then a tremendously important problem is before the farmer. Only through the perspective of fundamental life relationships can a farmer see his place. The education that prepares the subsoil of efficient citizenship for every other vocation must be the portion of the farmer, since he stands man to man in the general work of the world.

Second: Has Tennessee given the farmer the chance to become so trained? It is to our shame that we must answer no. The plan of our state does not give the farmer an equal chance. The educational system is not formed so that equal opportunity can be brought to the country and to the town. No complete system is offered to the whole citizenship. Elementary schools are required of any length the county may see best to run, but sometimes merely supported by the minimum State tax. The mere possibility of voting a high school tax is given to each county, and only sixty counties are maintaining county high schools for all the people. The normal schools and the State university are open only to those who complete high school courses, so more than one-third of the State is not using any system of training, but is satisfied with the teachers. Until the elementary school is made strong, and supplemented small amount of elementary work given, often by young, inexperienced by a uniform high school system over the whole State, so that those trained here can take advantage of the normals and university, then and not until then shall we have any system. In such a plan have the farmers in other States found salvation, and it must be the same in Tennessee. Why has not the Tennessee farmer been educated? The answer comes—it is the fault of your State educational system!

Third: With your system made complete and the compulsory laws enforced, one important forward step must be taken within the system, namely: The proper arrangement and evaluation of the courses of study. New things are being introduced and courses are rearranged. This is the period of danger. In such times even the best of us are apt to take

the flag for the cause and to judge a relatively insignificant thing as the most important, simply because it's new or interesting or attractive. Such is already the case with our courses of domestic science and agriculture. Taking a few notes on how to peel potatoes is not domestic science in reality, neither is sprouting a box of corn, agriculture, though they be directly related to these sciences. Carried on by our schools, without the proper evaluation of educational merit, these and other such things amount to little more than bubbles and explode as some of our best schools have done in this work. It is because we are tacking this work on to our curriculum as a step-child, without bringing it in as a real member of the family.

Some are looking to these courses as the panacea of all ills and are



Entomological Exhibit on Agricultural Special.

ready to hold them up along with canning club work and corn club work as the basic part of our educational program. To teach poultry-raising would embody perhaps more educational value than the raising of one-tenth of an acre of tomatoes under the United States Government. These clubs are of incidental and not of primary importance. They grow out of the fundamental values of the school life and are thriving upon educational principles, ages old. The demonstration work is the strong arm of education, wonderfully effective, but it wants to withdraw from the field when the strong educational program of the State

starts a policy that develops this phase of its life. The chief end of the club movement—canning, etc.—is to be social and to give the members an attitude toward certain subordinate principles of community interest. Every argument for it is found operative in the real live educational agencies of community life. One is permanent and organized, the other transient and shifting. I plead for the fundamental educational values to be used in our schools, so that farming life can be systematically and soundly advanced. Put into the course all that is really educational and let the school be what it ought to be—the chance for every farmer to get trained in all his relationships. I do not go into the content of this new school, but let it embody everything of educational value from every field organized around the idea of greatest service. I plead for the organization of fundamental educational values so that the farmer may be brought into the machinery that will produce the results mentioned above.

Some observations:

1. One great hindrance to complete school organization is the lack of money. The farmer has objected to paying taxes, but this is a wrong view, for the property should stand for its own tax. The farmer should say along with all others, "My property pays so much to the common good." Taxation is the only true sign of civilization.
2. County schools can be taught by as good teachers as the city schools. Supervision can be made effective in the county schools. Any teacher and any kind of house should no longer be tolerated.
3. Farmers should readily fall into the county unit of education and finish the system on this plan. The law does not provide for country districts to tax themselves as a corporation—the county is the unit.
4. Consolidation of schools with better teachers and ratio of supervision equal to the city should be the farmers' slogan.
5. Efficient citizenship should be the aim of every farmer's school, as it prepares for a better State.

When you add a new specimen to your flock, place the strange fowl by itself for a few days and watch for signs of lice or disease. A healthy flock may be ruined by the introduction of a bird which carries the germs of trouble.

Movable hog houses make it possible to distribute the hogs over the farm in clean, fresh quarters, thereby utilizing grass and forage crops to the highest degree and at the same time reducing the danger of disease to a minimum.

CROP REPORT FOR JULY.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., August 1, 1914.**

Reports from crop correspondents to the Department of Agriculture from eighty-eight counties in the State give indications of a considerable falling off in the production of the various crops, with the exception of wheat, which shows an increase over the production of 1913, which year also yielded a good crop of wheat.

This summary is made from reports made on the 20th of July, and at that time crops had already been seriously damaged by the continued dry weather. Rains about that time in some sections of the State afforded some relief, but corn, cotton, tobacco and the grasses are again suffering for rain. In the middle and western sections conditions were unfavorable for corn, cotton, tobacco, peanuts, potatoes and other vegetables. Rain was needed in all sections except a few localities where local showers occurred. Cotton needed rain generally, and in some sections was badly damaged. In some parts of the western section drouth of unprecedented severity continues. Most of the cotton district was still needing rain. A considerable acreage of early corn has been permanently damaged by the drouth.

Rains in some parts of East Tennessee served to revive crops, and were specially beneficial to market gardeners.

Early Irish potatoes were practically ruined by the drouth, and weather conditions were not favorable for planting the second crop.

In Lake County no rain is reported since the 4th of May. All crops were damaged, but cotton was holding up very well. In Obion County dry weather was reported ruining corn and young clover.

Lauderdale County reports no rain since the 4th of May, and crops suffering severely. Hill cotton was reported in very bad condition, but bottom cotton standing the drouth well. Early corn badly damaged. Some of it was plowed up and planted over.

One correspondent in Tipton County reports the worst drouth he had ever known in his forty-eight years behind the plow. He reports early corn worthless and cotton failing fast.

Shelby County reported no rain since the 4th of May, and early corn ruined. In Weakley County the drouth has materially damaged all crops, especially early corn, tobacco and Irish and sweet potatoes. Crockett County reports the most ruinous drouth in its history.

Madison County reports early corn ruined and young clover dead.

Haywood reports early corn a failure and everything suffering for rain. In Hardeman County the extreme dry weather has seriously damaged all crops. Fayette County reports early corn a complete failure, but late corn doing well. Local rains have helped in some sections of that county.

In Henry County no rain is reported since May 4. In Carroll County the dry weather has cut the early corn crop very short, and young clover and pastures are reported ruined. One correspondent in Henderson County says he is 69 years old and that the crop prospects are the worst he has ever seen. In Chester County corn is reported badly damaged, as is also cotton. McNairy County reports that late corn may make a fair crop with rains from now on during the season.

Benton County reports crops badly hurt by the drouth; no rain since May 7. Decatur County reports early corn severely damaged. Hardin County reported fine rains about the 19th, which will materially help crops. Perry County reported five weeks of dry weather and prospects for not over half a crop of corn, but peanuts not badly damaged and stock peas doing very well. In Humphreys and Houston counties the same reports of dry weather and severe damage are made. In Stewart County local rains are reported. Montgomery County reports spring sown oats a failure and a moderate yield of winter oats threshed.

Robertson County reports the tobacco crop in bad condition, but local rains have helped in some sections of the county; early Irish potatoes a total failure; more navy beans planted than ever before known. Cheatham County reports local rains doing some good, but tobacco a very short crop, and corn badly damaged, with nearly all young clover dead.

In Dickson County the dry weather has damaged all crops. Hickman County reports live stock as looking well, but pastures suffering for rain. Early corn is reported a failure in Lewis County; wheat crop very good. Local rains reported in Wayne County and also in Lawrence. Sumner County reports light showers, but still needing general rains. Late corn is reported as doing very well. In Williamson County it is reported that early corn will not make more than one-fourth of a crop, and late corn about three-fourths; tobacco is reported badly damaged; live stock is reported as looking well.

Rutherford and Maury counties report good rains during the middle of July. Marshall County reports continued dry weather, while Bedford reports rain doing much good. Giles County had rain on the 14th and 15th. Lincoln County reports serious damage by drouth, but had had good rains about the middle of the month. Moore County reports

crops cut short by the drouth, but rains had benefited late corn. Pickett, Overton and Jackson reported rains that promised much good to late corn and pastures.

Smith County reported local rains about the middle of July, while Putnam reports continued drouth. White County reports the best wheat crop in many years, and local rains benefiting late corn and pastures. Warren and Coffee report good rains. Grundy and Scott also report local rains. Morgan County reports a failure of the Irish potato crop. Campbell County reported good rains about the middle of the month. Bledsoe was still dry, while Sequatchie reported the drouth broken.

Claiborne, Hancock and Grainger counties report the drouth broken. Grainger reports the best wheat crop in many years. Rhea and Roane report good local rains. All crops were injured by the drouth in Loudon. Meigs and Bradley report all crops except cotton injured by the dry weather. Johnson County reports much damage by drouth, but local rains helped some. That county had the finest wheat crop in years. Sullivan County reported beneficial rains on the 12th. Carter County reported local rains. Hawkins reported a good wheat crop. Unicoi reports some local rains, but much damage by the drouth. Greene County reports tobacco in good condition, but a short crop. Hamblen, Jefferson and Cocke counties report good rains.

To summarize the crop situation, it seems that there will hardly be more than half a crop of corn. The wheat crop was the best in many years. The hay crop is very short, and there will be a decreased yield of tobacco. Gardens and pastures were badly damaged in all sections of the State. On account of the drouth, live stock is not reported in as good condition as usual.

Below is the summary, for comparison, of the reports of this department for the month of July, 1913, and 1914:

	Per Cent. 1913.	Per Cent. 1914.
Cotton, condition	83	77
Wheat, estimated yield (bushels).....	17	19
Oats, estimated yield (bushels).....	28	24
Millet, condition	73	67
Corn, condition	81	71
Tobacco, condition	72	61
Stock peas, condition	81	69
Irish potatoes, condition.....	75	49
Sweet potatoes, condition.....	81	69
Sorghum, condition	77	69
Tomatoes, condition	77	67
Peanuts, condition	83	70
Young clover, condition.....	64	55
Live stock, condition.....	87	84
Hay, crop saved.....	76	60
Alfalfa, condition	82	67

JULY CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT.	COUNTY.	Cotton—condition.	Wheat—estimated yield.	Oats—estimated yield.	Millet—condition.	Corn—condition.	Tobacco—condition.	Stock Peas—condition.	Irish Potatoes—condition.	Sweet Potatoes—condition.	Sorghum—condition.	Tomatoes—condition.	Beans—condition.	Young Clover—condition.	Live Stock—condition.	Hay Crop Saved.	Alfalfa—condition.
A	Lake	80	19	15	75	65	60	75	65	60	60	80	...	75	85	100	85
	Obion	70	16	20	...	70	60	85	65	50	55	...	...	35	78	100	...
	Dyer	80	18	32	60	70	60	60	50	50	25	25	...	50	70	90	...
	Lauderdale	72	18	32	60	60	60	60	55	82	65	25	60	50	82	55	...
	Tipton	55	18	29	...	70	70	70	80	73	62	65	...	60	89	82	100
B	Shelby	45	...	...	65	65	...	45	55	70	70	60	...	45	83	45	50
	Weakley	65	18	30	...	53	45	58	45	38	58	25	...	15	80	70	...
	Gibson	85	15	12	70	85	...	85	75	85	80	...	...	40	85	40	...
	Crockett	38	19	18	...	45	...	50	70	35	58	70	...	80	80	30	50
	Madison	97	27	34	90	66	65	69	90	100	62	90	50	90	94	100	70
C	Haywood	98	10	18	...	63	...	69	47	40	42	75	...	38	64	50	...
	Hardeman	68	20	24	...	63	...	69	75	50	75	70	80	50	80	32	...
	Payette	59	16	22	60	48	60	65	62	54	60	59	...	50	82	37	...
	Henry	62	12	25	30	68	50	43	70	75	60	65	...	50	75	80	...
	Carroll	90	15	25	85	70	50	100	100	63	40	90	100	40	78	75	...
Upland Section of West Tennessee.	Henderson	70	15	20	...	55	75	75	...	78	78	75	...	30	78	71	...
	Chester	63	...	...	...	...	...	70	50	...	...	...	...	...	83	63	...
	McNairy	78	20	20	...	50	...	53	50	55	25	40	60	50	83	45	...
	Benton	55	24	...	50	50	60	50	50	50	55	...	60	...	75	25	...
	Decatur	65	...	...	50	60	...	70	60	90	100	60	75	60	83	47	...
Western Section of Middle Tennessee.	Hardin	75	17	24	42	53	...	70	60	90	100	60	75	60	83	47	...
	Perry	70	14	20	50	68	63	45	25	50	...	63	40	83	60	...	...
	Humphreys	...	...	...	40	70	...	50	40	35	50	50	60	25	75	30	...
	Houston	...	19	27	45	48	46	42	29	43	40	53	58	33	83	52	...
	Stewart	...	15	25	43	69	34	50	25	50	70	50	...	...	77	77	60
C	Montgomery	...	23	18	40	45	25	66	25	60	75	50	...	40	80	66	75
	Pobertson	...	20	32	80	45	49	60	41	50	85	78	...	45	85	40	...
	Cheatham	...	15	25	60	60	35	95	25	60	70	...	...	20	80	30	...
	Dickson	...	15	20	50	80	25	50	50	100	100	75	90	30	100	60	...
	Wickman	...	20	25	50	65	45	...	65	50	50	50	55	55	70	45	...
	Lewis	...	12	20	50	38	75	38	35	63	45	20	75	50	80	35	...
	Wayne	...	18	20	60	100	...	75	40	60	...	...	...	50	90	50	...
	Lawrence	70	13	25	40	55	...	50	30	70	60	...	55	25	85	50	...

Cumberland Plateau.

Summer	19	27	45	60	49	52	25	72	62	39	..	37	75	64
Trousdale	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Davidson	20	30	60	60	..	50	18	60	25	80	..	70	88	40
Wilson	24	13	70	40	..	55	33	50	10	65	..	70	80	60
Williamson	19	44	69	69	50	65	30	30	74	35	25	55	84	45
Rutherford	87	18	35	60	..	80	30	30	20	..	..	65	80	80
Cannon	90	25	60	70	..	..	30	30	30	..	..	60	85	75
Mauzy	90	20	70	..	..	80	45	75	20	..	..	60	90	75
Marshall	18	15	60	50	..	85	45	75	70	65	85	40	85	20
Bedford	100	43	60	50	..	64	23	72	75	50	..	32	79	35
Giles	73	35	32	64	..	73	48	68	78	60	90	65	95	83
Lincoln	18	23	80	88	..	73	48	68	78	60	90	65	95	83
Moore	20	27	49	68	..	75	42	58	55	85	..	30	80	70
..	..	..	..	..	..	..	..	..	..	..	..	57	84	63
Macon	18	40	..	..	40	50	40	..	..	..	30	..	..	60
Clay	..	..	..	..	..	..	..	..	..	..	..	..	..	..
Pickett	20	17	90	..	190	50	..	..	..	..	70	90	100	..
Overtown	95	19	24	85	87	89	68	93	93	81	100	75	85	63
Jackson	20	15	75	80	48	85	40	85	85	55	..	35	85	80
Smith	23	15	50	69	73	85	47	78	80	90	50	65	84	54
Purnam	80	19	64	80	..	80	45	87	62	67	..	67	82	70
DeKalb	..	..	..	..	..	..	..	..	..	..	..	..	..	..
White	95	18	63	85	95	73	58	88	35	75	95	58	88	45
Warren	14	23	65	73	..	73	58	88	35	75	95	58	88	45
Cohee	75	20	71	77	80	79	48	80	81	72	80	72	84	40
Grundy	18	12	100	80	..	100	30	85	80	90	80	10	90	30
Franklin	20	40	80	80	..	75	40	90	..	..	60	80	80	50
Scott	90	30	15	80	90	80	50	85	100	85	85	85	85	60
Fentress	18	14	60	95	..	100	90	85	85	85	85	85	85	90
Morgan	21	22	82	92	90	89	47	82	82	88	..	83	98	35
Cumberland	30	25	85	85	85	90	60	80	85	80	85	80	95	85
Van Buren	15	20	50	80	..	80	50	80	100	..	60	100	80	85
Campbell	22	25	75	80	..	84	45	70	65	54	..	57	80	65
Bledsoe	18	..	75	75	..	75	50	100	..	..	75	85	100	75
Sequatchie	..	..	..	..	..	..	..	..	..	..	25	90	50	..
Marion	18	20	85	85	..	75	50	100	60	50	..	25	90	..

JULY CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Cotton—condition.	Wheat—estimated yield.	Wheat—estimated yield.	Millet—condition.	Corn—condition.	Tobacco—condition.	Stock Peas—condition.	Irish Potatoes—condition.	Sweet Potatoes—condition.	Sorghum—condition.	Tomatoes—condition.	Peanuts—condition.	Young Clover—condition.	Live Stock—condition.	Hay Crop Saved.	Alfalfa—condition.
G Central Section of East Tennessee.	Claiborne	16	13	85	75	75	60	60	75	75	75	75	75	75	75	75	75
	Hancock	23	25	59	75	25	68	75	65	75	75	75	75	75	75	75	75
	Anderson	100	16	59	69	64	34	75	64	75	64	82	75	75	75	75	75
	Grainger	16	27	80	80	60	40	75	65	75	65	75	75	75	75	75	75
	Union	18	15	80	80	60	40	75	65	75	65	75	75	75	75	75	75
	Knox	50	18	75	80	75	65	75	65	75	75	75	75	75	75	75	75
	Rhea	35	18	75	80	75	65	75	65	75	75	75	75	75	75	75	75
	Roane	35	18	75	80	75	65	75	65	75	75	75	75	75	75	75	75
	Loudon	18	10	75	80	75	65	75	65	75	75	75	75	75	75	75	75
	McMinn	85	20	84	80	75	65	75	65	75	75	75	75	75	75	75	75
	Meigs	90	19	88	80	83	50	83	85	73	60	83	60	80	75	75	75
	Bradley	90	18	80	80	83	50	83	85	73	60	83	60	80	75	75	75
	Hamilton	18	15	60	60	75	25	50	75	65	73	73	75	75	75	75	75
	James	18	15	60	60	75	25	50	75	65	73	73	75	75	75	75	75
H Mountain Section of East Tennessee.	Johnson	18	10	75	75	88	45	82	84	88	84	88	84	88	84	84	84
	Sullivan	18	27	65	69	50	42	75	90	38	90	38	90	38	90	40	80
	Carter	18	14	85	85	90	80	90	90	90	90	90	90	90	90	90	90
	Hawkins	19	27	60	90	69	38	60	77	70	77	70	77	70	82	57	50
	Washington	19	13	90	90	95	45	70	80	85	80	85	80	85	85	35	50
	Unicoi	19	21	90	95	90	39	88	85	85	85	85	85	85	85	35	50
	Greene	19	23	90	95	90	39	88	85	85	85	85	85	85	85	35	50
	Hamblen	19	23	90	95	90	39	88	85	85	85	85	85	85	85	35	50
	Jefferson	20	29	70	95	71	43	72	77	74	90	72	77	74	90	72	60
	Cocke	18	27	79	84	79	34	80	78	84	78	84	78	84	78	84	84
	Sevier	18	16	70	82	80	30	70	80	75	80	75	80	75	80	75	80
	Blount	20	20	80	80	80	30	70	80	75	80	75	80	75	80	75	80
	Monroe	19	18	90	100	100	35	85	85	85	85	85	85	85	85	90	75
	Polk	20	23	80	80	75	25	80	80	80	80	80	80	80	80	90	75
	General average	77	19	24	67	71	61	69	49	69	69	67	70	55	84	60	67

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IN THIS ISSUE:

Knapp School of Country Life.

Soy Bean as a Farm Crop. Rural Club and its Problem.

Farm Practice in Insect Control.

Determined War Against Weeds. Sheep in the South.

Modern Ways in Bee-Keeping.

August Crop Report.



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THE SEAMAN A. KNAPP SCHOOL OF COUNTRY LIFE.

A real school of country life is being launched as a department or school in the new George Peabody College for Teachers at Nashville. This is the first effort in America to establish a permanent institution of this kind for the thorough and unceasing study of rural life problems. Of course there have been a number of heroic efforts heretofore made, but they have been in connection with brief conventions,



W. K. Tate, Professor of Rural Education; John Lee Coulter, Professor of Rural Economics, and Kary C. Davis, Professor of Agriculture, George Peabody College for Teachers, Nashville.

summer schools, and other similar short courses. This new school is to be a *permanent* part of the American system of education.

This school will devote its time chiefly to the following problems:

1. Better farming, better seed, better live stock, better fruit, better management.
2. Better rural schools—redirected along more practical and useful lines.

3. Better marketing, better buying and selling—cooperation.
4. Rural credits and farm ownership—tenantry systems.
5. Good roads and better transportation.
6. Improvement of social conditions.
7. The rural home and its surroundings.
8. The rural church as a social center.
9. Rural leadership.

Teachers of agriculture, farm demonstrators, club leaders, rural extension workers, and others interested in rural economics will be given special training for the lines which they are to follow.

The need for such a school is well recognized by such prominent economists and students of American conditions as the present Secretary of Agriculture, Hon. David Houston, leading state superin-



Industrial Arts Building George Peabody College for Teachers, where Students in the Knapp School of Country Life will do part of their work.

tendents of public instruction, and other noted educators. These leaders have hailed the establishment of the school with great delight and have given it every means of encouragement. The General Education Board has been greatly praised for its philanthropic endeavor when it took the first step toward the establishment of such a school at Peabody College for Teachers.

The wastes existing in ordinary farming prove that there is much need of leaders such as this school is planning to turn out. The greatest wastes in farming today are found in poor management, poor marketing, scrub live stock, cumbersome and antiquated machinery, bad roads, failure to control natural enemies, such as insects and plant diseases, the use of low grade and adulterated seeds, poor management

of soils, and a host of other things which are noticeable by the close observer.

Perhaps more important than the ordinary farm waste referred to here should be considered the inconveniences of the ordinary country home. This school will do much to show how it is possible to have proper sewerage systems, proper water supply, better home conveniences, so that living in the country will be even more pleasant than in the city. The great rush to the city from rural districts will be checked when people realize that with little or no additional expense the necessary conveniences and healthful surroundings may be supplied to their country homes. It has often been shown that the greatest danger of typhoid fever and other similar diseases is in the country districts. This condition may be entirely changed by proper instruction along these lines.

The Knapp School of Country Life will be a mighty force in the



This Building is the Present Temporary Headquarters of the Knapp School of Country Life, at George Peabody College for Teachers, Nashville, Tenn.

redirecting of all rural instruction through its teachers and students. Rural schools will be made more practical. Much of the money and effort now expended is lost forever and is, in many cases, indeed a great detriment to the districts in which the instruction is given, because it causes young people to leave the rural communities and seek employment in cities. It is often truthfully said that many country schools train young people away from the farm instead of toward it. This should not be so. In cases where the schools have been made more practical the results are far more encouraging.

The special need of the South for such a department as this in the new Great Central Teachers College for the South has been often remarked by those interested in its establishment. The educators of the South are in a more receptive mood for such a change as this school is bringing about than are the people of any other part of the country. This is not idle talk, but facts can be given to substantiate it.

Tennessee is particularly fortunate in having this new line of work established on its soil. The capital of the State is in the geographical center of the greatest productive agricultural region in America. It is only a little south of the actual center of the population of the country. It is the most favorable point for unifying or centralizing both the North and South in rural life matters. It is easily accessible from all points of the country. It can be called the center of the South and yet is a western city. It is accessible to the North, being less than twelve hours' ride from the agricultural regions of the Northern States.

The thousands of teachers taking their training in George Peabody College for Teachers will be trained in the rural life spirit and will go out as a mighty army to help in the reorganization and redirection referred to above.

The ultimate purpose in establishing a permanent school of Country Life is to check the exodus from country districts to congested cities. Life in the country must be more tolerable, more attractive, more endurable. Much can be done to make boys and girls prosperous, healthful, and contented on the farm. Homes can be made more comfortable, drudgery less irksome, all lines of work more scientific and uplifting, to say nothing of increased profits from farm work.

THE TOUR OF THE AGRICULTURAL SPECIAL.

The tour of the Agricultural Special, operated by Commissioner T. F. Peck, of the State Department of Agriculture, and the railroads of Tennessee, which was begun on July 15, was continued through the month of August, with large crowds at every station. The tour will end on September 17, and in the next issue of Tennessee Agriculture there will appear a resume of this tour.

The beginner should start with good breeders. Pure-bred animals can be had at living prices and are as good for growing pork as prize animals costing high prices.

SOY BEAN AS A FARM CROP.

By T. F. PECK, *Commissioner of Agriculture.*



There are five reasons advanced why profitably added to the soy bean can be your crop rotation. They are: Grain production, forage and silage, green manuring, pasture, and gathering nitrogen from the air and storing it in nodules on the roots. The grain of the soy bean is rich in protein, or muscle-building food, and in oil, and thereby compares favorably with cottonseed meal and oil meal. It contains more than one-third more protein and twice as much fat as cowpea hay. In an experiment conducted at the experiment station in feeding dairy cows it was found

that soy bean meal was superior to cottonseed meal for producing both milk and butter, when each of these highly nitrogenous feeds were fed with the same other fat-producing feedstuffs.

As a feed for hogs, several stations have tested the value of soy bean meal. The Indiana Experiment Station found that a ration embracing soy bean meal as the protein portion of the feed gave larger daily gains from smaller quantities of feed for each pound of gain than did wheat middlings or tankage when used under similar conditions for pork production.

The soy bean, therefore, serves most satisfactorily the purpose of a suitable grain for use in balancing the high carbohydrate content of corn.

Soy bean hay, when cut at the proper stage of growth and carefully cured, is excellent, and for dairy cattle at least yields results equal to alfalfa hay. For hay production soy beans may be planted in cultivated rows, or, when the ground is free from weeds, they may be drilled or broadcasted.

To get the best hay from soy beans, they should be cut when half or more of the pods are fully grown, but before they begin to change

color in ripening. Another rule, which is probably the better one to follow, is to cut them when the top leaves begin to turn yellow. At this stage of growth the largest yield and at the same time a good quality of hay will be secured. The hay is easier to cure than cowpea hay, the amount of moisture in the vines at harvesting time being less.

The soy bean crop can often be profitably utilized by pasturing, particularly to hogs, especially when fed corn in addition. This is advisable when harvesting is interfered with by lack of labor, bad weather, or other causes, and when the crop is grown especially for soil improvement. By this means not only is the crop profitable in itself, but the manure is returned to the soil. The usual practice is to turn the hogs into the soy beans when the pods are nearly full of grain, but before they have begun to ripen.

Soy beans are more commonly grown with corn than with any other crop. They are planted in different sections in various ways, namely, in alternate hills, with the corn in the same row, in alternate rows of each, in alternate series of two rows of each, or broadcasted in mixture. Such fields when planted in rows may be harvested for silage, or where the rows alternate the two crops may be harvested separately. Sometimes such mixed fields are utilized by pasturing to hogs. The beans should be planted in between the corn rows at the time of the last cultivation.

THE RURAL CLUB AND ITS PROBLEM.

BY ELIZABETH D. ABERNATHY.

In the February number of the *Ladies' Home Journal*, Mrs. Mary I. Wood, in her department of What Women's Clubs are Doing, says:

"As the club movement grows in usefulness and service the problem of the club in the rural community attracts much attention. The advent of the telephone and the parcel post and the good roads movement have brought the urban advantages within easy reach of the rural inhabitants. But the club movement has been somewhat slow to meet the needs of the woman who lives on the farm. The best club women of the country are giving a great deal of thoughtful attention to the subject. That the woman of the farm needs the club is no more true than that the club needs her. The strength of the club movement lies in the fact that it touches all kinds of women, binding them together in a great band of helpful sisterhood, and this band receives great strength from the women of the lesser towns and the rural communities."

Yes, the rural club is a problem. The rural school is a problem.

The rural church is a problem. The farm woman of today is almost overwhelmed with problems. Her first duty outside of her home is, she feels, to the church of her community. So in nearly every country neighborhood we find the women organized for church work of some kind. She barely has time for this one club; but she reads of the work being done by county and State organizations of various kinds, and longs for a part in all these movements for social betterment.

About four years ago this longing for service brought together a few of the women of our community into an organization which, for lack of a better name, we called the Pleasant Valley Ladies' Aid Society. So weak were we and few in numbers, that we asked some city friends to join us. As they had been reared among us, and loved our church and people, they promised us their support. Don't forget this feature of our organization when you plan a rural club. In this particular we builded better than we knew.

The main purpose of our society was church support; but we wanted to help not only the church, but the school and the neighborhood. The church was in debt; the building needed repairs; the collections were falling behind every year; church officials were discouraged and ready to resign. The school—but the less we say about the school the better. There was, it seemed, no community spirit among us. Something had to be done, so we organized.

From the first we studied conditions and tried to make our work conform to the needs of the people. That is why our society grew. Soon it developed a branch, the Busy Bee organization, a kindergarten for the little girls who wanted to share our activities. Next came a domestic department.

How did this domestic department find its way into a Ladies' Aid Society? Well, we were seeking topics for discussion that would interest every woman in the community. That led naturally to poultry, butter, eggs, etc. Then in Pulaski a Homemakers' Club was organized. We were interested in the things this club stood for, but Pulaski was eight miles away. We could not all attend those meetings. One or two of our members joined the Homemakers' Club, and through these members we hoped to keep in touch with the work of this county organization.

In the course of time, as we were always needing money, and more money to carry on our plans, we had to learn how to make more money. So we studied farmers' bulletins and began to cooperate in marketing our butter. Thus we became a Cooperative Ladies' Aid Society—a kind of link between the church and the work-a-day world.

While we have accomplished no great things, this striving to—

gether for social betterment is, we believe, developing community spirit. With our help the officials have paid the church debt, repaired and painted the building, and bought a new organ. By the way, the Busy Bees helped pay for the organ. For the last three years the pastor's salary and the conference collections have been paid in full. During 1913, members owning neither houses nor lands contributed for church support from two to twelve dollars each—their Sunday eggs. Last fall one of these women said to me, "This has been the happiest year of my life. Working together is so nice. It has been such a help to me."

I cannot enumerate all our successes nor our many failures. There were repeated failures where we least anticipated them; but along several lines we have succeeded far beyond our expectations.

BACK TO THE FARM.

For a good many years, and especially since the perfection of machinery and the growth of manufacturing, there has been a constant flow of people from the country to the cities or laboring centers. Each city became a catch-basin or a seething cauldron, into which was dropped all kinds and conditions of humanity. These streams, like Tennyson's brook, run on forever, and continue pouring in and carrying their flotsam and jetsam to common centers. The submerged tenth form the mudsill or foundation for this curious society, and, of course, the fortunate few rose to the surface, and when the cauldron overflowed they were the first to be thrown out. These wealthy ones are now reversing the tide, and are going back to the country. Men in the cities who can afford to do so are providing themselves with country estates or retreats. They find life in the crowded metropolis too suffocating and cramped, and they run away where they can have room to breathe and move in. With rapid transit distance has been largely annihilated, and people can enjoy the liberty and glory of the country, while doing business in the city. Harold McCormick has a beautiful home thirty miles out of Chicago, and he travels to and from his business in the city by the aid of a hydroaeroplane, making the distance in less than an hour. Fast automobiles on good roads can beat this time, but a flight through the air or a skim over the waters removes the traveler from many annoyances that he meets with on land.—*Memphis News-Scimitar*.

Lambs make greater gains in feeding than old sheep.

FARM PRACTICE IN INSECT CONTROL.

BY G. M. BENTLEY, *State Entomologist.*



Only within a period of a few years has the practical bearing of insects to the farmer been fully appreciated. Farm practice in relation to insect control is not too well understood by our average farmers yet, and a few suggestions at this time may not be amiss. If every farmer could realize that annually he pays a tax to insects of \$200 to \$1,000, or in other words, one-tenth of all his crops goes to feed these pests; if he also knew that the major part of this loss is preventable he would, I'm sure,

see the practical value of insect study.

More emphasis should be laid on the fact that good farming and insect control go hand in hand; the one depends upon the other. In planning a crop rotation it pays well to give due consideration to such selection of crops that will tend to check, rather than to encourage, insect attacks.

Crop Rotation—Emphasis is placed by farm experts upon sowing a shallow rooted plant to follow a deep rooted one, the purpose being to utilize the nitrogen gathered by the deep rooted plants or legumes. This is a practice to be encouraged for its good agriculture and at the same time it tends to lessen the loss which might result from insects. To grow the same crop year after year on the same soil depletes the soil and is not a good method even in sections where the annual overflow of a river may make it possible to get good yields. The insects which feed upon the crop will be increased from year to year and eventually cause a disastrous attack. In a rotation sow crops which are not closely related botanically.

Volunteer Crops—Too great importance cannot be placed upon the careful turning of soil and preventing volunteer crops. The writer's attention has many times been called to serious Hessian fly outbreaks which could have been easily prevented by directing care in thorough plowing. Volunteer oats, barley, rye and wheat all furnish ideal sources for harboring the fly over the winter months.

Fall Plowing—Deep fall plowing has great value in destroying many kinds of soil-inhabiting insects, as well as furnishing a good seed bed and conserving soil moisture. The over-wintering insects in the soil will be killed in large numbers by this method.

Cleaning Up Trash—Beneath remnants of crops, old vines, stubble, etc., many insects have the habit of collecting and hiding away during cold weather. To practice clean culture, therefore, will help eliminate such insects and also furnish more plant food to the soil.

Weeds—Before the seeds of weeds ripen all weeds should be turned under. Some States have rigid laws in regard to the destruction of certain noxious weeds. This is well and good, for proper attention directed along these lines keeps in check the weeds and also destroys numerous insects. Many of the worst pests feed for a part of their life upon weeds. The dry stems also furnish wintering quarters for insects.

Time of Planting or Harvest—With the Hessian fly it is the aim of the grower to defer the planting of winter wheat for a few days beyond the customary time, so that the plant will not be large enough to serve the purposes of the fly when it comes out later to lay eggs. On farms where this procedure is followed carefully and accurately injury from this pest has largely been avoided. With other insects similar variations in farm practice have been worked out wherever the habits of the pest make such a remedy possible.

Since we cannot always predict what pests will be prevalent in a given year, the wisdom and the advantage of maintaining vigorous and healthy growth by all practicable means is apparent.

The fact is again here emphasized that whatever constitutes good farm practice in one regard is apt to help out as well in controlling insects.

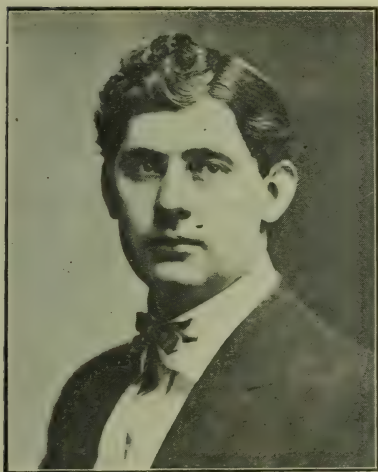
KIND TREATMENT ALWAYS PAYS.

Good cows are not developed by harsh treatment. If she expects a whack by a milk stool or a fork handle when she is approaching, is it any wonder she is nervous and kicks? If, on the contrary, she never knows fear, and as you sit down to milk her she tries to lick your shoulder and thinks you are the best calf she ever had, you can figure that kind treatment pays in dollars and cents, or from any point of view.

The most serious objection to selling hay from the farm is that it carries away too much of the fertility of the farm.

DETERMINED WAR AGAINST WEEDS.

BY A. L. GARRISON, *Chief Feed, Seed and Fertilizer Inspector.*



The annual losses caused by weeds on Tennessee farms deserve more serious consideration than they have thus far been given by the farmers of the State. The Department of Agriculture has accumulated considerable evidence which shows certain portions of the State to be infested with weeds to such an extent that it is very advisable to carry on a determined warfare to eradicate them.

For many years those interested in scientific and permanent agriculture have thoughtfully considered the damage done by weeds and have issued repeated warnings. But this work was confined almost entirely to preventive measures, and largely along the line of seed selection and seed inspection for the purpose of insuring clean seed.

Farmers on virgin soils of the United States where weeds were not numerous were inclined to ridicule the idea that weeds could ever become seriously troublesome. The fears of the scientists, however, have been realized, and many farms in the United States have been abandoned because weeds multiplied and spread so rapidly that the farmers have become discouraged and given up in despair. That such conditions as these exist even in Tennessee may be surprising to many; yet such is the case, and noxious weeds are spreading here at a rate which has alarmed those who are acquainted with the seriousness of the situation.

On many farms in this State fully twenty-five per cent of the crop producing capacity has been destroyed by weeds. What this means to the owner of a 160-acre farm can be shown by a few figures. Twenty-five per cent of 160 acres is 40 acres. At 30 bushels per acre this area should produce 1,200 bushels of corn. With corn at 60 cents per bushel the crop would be worth \$720. With land worth \$100 per acre, the farm would have a value of \$16,000. A loss of \$720 on an investment of \$16,000 is a loss of 4 3-4 per cent—surely more than the average farmer can afford to bear.

Very good crops must be grown on the remainder of the farm if such a loss is to be overcome. The majority of farmers cannot long make a profit under such conditions. Fortunately such conditions do not exist in all sections of the State, and farmers whose farms are not yet infested should take extreme care that weeds are eradicated before they spread. This statement is designed to arouse those interested in better farming to some energetic and concerted action for weed control and eradication before conditions become more serious.

The successful eradication of weeds depends upon a knowledge of two important points. First, how long does the plant live? Second, how does it reproduce and spread?

With respect to duration of life, there are three classes of plants—annuals, biennials and perennials. An annual comes up from a seed, bears flowers and seeds, and later dies, all within one year. A biennial grows from a seed, but produces only leaves the first year. The root, and sometimes the leaves, lives through the winter. The second year a flower stalk comes up, seeds are produced, and the plant dies. A perennial is one the roots of which live on year after year unless killed in some way. Depending upon conditions, the plant may or may not produce seed every year.

The importance of the subject will not permit of touching on the methods of eradication, which will be treated in a later article.

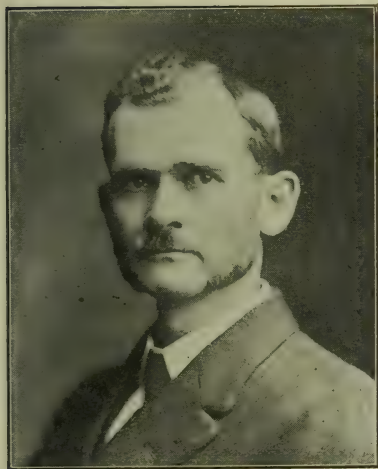
FACTORS OF PROFITABLENESS IN FARMING.

1. Low real estate prices.
2. Farm products of classes deficient in supply.
3. Magnitude of the farm business, measured either by land farmed or amount of labor required.
4. High quality in products.
5. Reputation of the producer: Applies especially to the production of pure-bred breeding stock.
6. Advantageous marketing.
7. Productiveness of animals kept.
8. Largest yield with relatively little labor and fertilizer.
9. Low cost of production. (Involves good farm organization.)
10. Stability of profit depends on the staple character of the products.

During the summer at least 2 1-2 inches of silage should be fed each day.

MODERN WAYS IN BEEKEEPING.

BY DR. J. S. WARD,
State Inspector of Apiaries.



In this age of progress the man succeeds who combines knowledge with energy and who uses all modern appliances and conveniences in carrying on his work. In no avocation is this more important than in beekeeping. Every beekeeper should post himself in all modern methods and should provide himself with all approved appliances. To this end a good text-book on beekeeping should be purchased and studied; modern hives and appliances should be selected from the catalogues of supply houses, and

into the work should be put energy and enthusiasm. If beekeeping is followed after these suggestions it means a success that will surpass most, if not all, of the side lines of farm life. Any farmer who wants to can easily care for a hundred stands of bees and be assured of at least five hundred dollars every year, and sometimes much more. After the original outlay has been made of about four dollars for each hive, a yearly income of from five to ten dollars can be counted on with but little or no additional expense.

The following suggestions are from the experiences of hundreds of successful apiarists, who have proven modern beekeeping to be a commercial enterprise:

(1) Transfer all bees from the old log "gums" and home-made hives to the modern hives with their tin moveable frames and extracting supers.

(2) Buy all supplies in the winter or early spring. Nail together and paint all hives. Wire all deep frames and use full sheets of wax foundation in all frames and sections. Have everything ready for the honey flow and early swarms.

(3) The beginner should use the shallow supers and rim for chunk or extracted honey instead of the pound sections. More money can be made selling extracted honey at fifteen cents a pound than pound sections at twenty-five cents each. In addition to this the pound sections are much more troublesome. Every hive should have at least two supers.

(4) Order full-blooded Italian queens, kill the black or hybrid queens and introduce the new queens after the instructions on shipping cages. There are no better queens than those bred in Tennessee. Buy the "untested" queens.

(5) Keep the queen's wings clipped and thereby be assured of not losing any swarms.

(6) Prevent excessive swarming by giving plenty of super room and enlarging the entrance to the hive.

(7) Remove all supers for the winter and be sure that each colony has plenty of stores for the winter.

(8) Feed each hive in the fall that has a weight of less than thirty pounds. Feed honey or solution of granulated sugar—two parts of sugar to one of water. Feed at night to prevent robbing and always on the inside of the hive in an empty super.

(9) Keep all colonies strong by feeding and by uniting the weak ones. The moth or wax worms give no trouble in colonies that are kept strong in bees.

(10) Get a solar wax extractor and melt up all the old discarded combs, all the "uncappings" and all the bur comb about the hives.

(11) Get a good text-book on beekeeping and subscribe for at least one of the bee journals. If possible, attend the annual meetings of Tennessee Beekeepers' Association.

(12) The duties of the State Inspector of Apiaries are to promote the beekeeping industry. Report your troubles directly to him, especially all evidences of bee diseases.

CRIMSON CLOVER IS BEST FOR PLOWING UNDER.

A reader asks the following question: "Where red and crimson clover do equally well which would you prefer in a rotation to plow under in the spring for corn or cotton?"

For such a purpose we prefer the crimson clover, because it makes a rapid growth early in the spring and matures a crop two or three weeks earlier than the red clover, thus permitting an earlier preparation of the soil and planting of the corn and cotton. We do not advise following crimson clover with cotton, because it does not permit a sufficiently early preparation of the land for the planting of the cotton, and red clover would make the planting still later. Even for corn, we think the earlier planting which is possible after crimson clover is sufficient reason for preferring it to red clover for this purpose.—*The Progressive Farmer*.

WARNING AGAINST DANGEROUS PRESERVING POWDERS AND CANNING COMPOUNDS USED BY THE HOUSEWIFE.

The attention of the United States Department of Agriculture has recently been called to the widespread use, especially in rural communities, of salicylic acid in putting up preserves. The head of a large drug and chemical supply house states that people living in Southwest Virginia, North and South Carolina, Kentucky, Tennessee, and Western Georgia, have been purchasing salicylic acid in one-quarter-pound packages for a number of years and that this practice has grown to an enormous extent. This dealer states further that only a few weeks ago he received an order from one wholesale grocer for fifty gross of these goods.

The department is aware that this practice is not confined to salicylic acid under its own name alone, but that large quantities of this acid, and of boric acid as well, are sold under fanciful names as preserving powders or canning compounds at prices which are much in excess of their real value.

In the directions for use, the housewife is told to fill the jar with the fruit or vegetables, cover with water and add a teaspoonful of the powder. It is true that these powders may prevent the decay of the fruit or vegetable, but they also encourage uncleanly or careless work, and their excessive use may be attended with very serious effects upon the health. Salicylic acid is a medicine of the greatest value in acute articular rheumatism and certain other diseases. It is well known as a poisonous substance, and one of the evils which may accompany its use is derangement of the digestion. It is therefore plain that its extensive use in food may lead to disturbance of digestion and health.

It is entirely practicable to put up both fruits and vegetables in such a manner that will keep indefinitely by sterilizing the products by means of heat, and there is no excuse for running any risk by the using of preserving powders. The Department of Agriculture has issued the following Farmers' Bulletins on canning and preserving:

F. B. 203, Canned Fruit, Preserves and Jellies.

F. B. 359, Canning Vegetables in the Home.

F. B. 521, Canning Tomatoes at Home and in Club Work.

These bulletins, which may be obtained without cost by applying to the Division of Publications of the department, give exact directions for canning and preserving foods without the use of preserving powders or canning compounds.

BEEF CONSERVATION.

It would be a mistake to assume that farmers have not memories. In cases where their individual interests are at stake they remember things as well and as long as other people. Children once burned are said to steer clear of the fire. Twenty years ago the farmers of the country were not burned; but they found that it was time and labor wasted to raise and fatten beef cattle. Such cattle were virtually a drug in the market, and it took a number of them to bring enough money to pay the farmer's taxes.

The farmers who lived then, a large number of them are living now. They are ready to raise cattle. They know that while raising cattle they may at the same time fertilize their soils. But they are not entirely convinced that should they raise as many cattle now as they did then the supply might not exceed the demand, and that prices would not tumble accordingly.

It is estimated that the population of the United States in 1907 was something over 87,000,000. At that time, exclusive of dairy cattle, there were 51,566,000 cattle in the country. It is estimated that the population of the country is at least 6,000,000 more than it was in 1907. The number of cattle in the country now, exclusive of dairy cows, is 15,000,000 less than in 1907. With these figures in mind it is easy to understand that the price of beef has gone up to a figure that makes the consumption of beef, as a diet, almost prohibitive.

And these figures are sufficient to convince farmers that they take no risk in raising beef cattle. It should be known, and kept in mind, that the day for raising range cattle has passed, never to return. The supply of beef hereafter must come exclusively from the farms. All that is necessary to increase the beef supply is to convince the farmers that they will be sure to get a fair price for their cattle. And the farmer should have it understood that he will get his fair share for the beef he sells of the price paid by the ultimate consumer.

It will be easy for the American farmers to grow double and more than double the number of beef cattle they are now growing, and they will do it if convinced that it will pay them. With the figures above given, farmers should readily see that with the large increase in the number of the eaters of beef, they will take no risk in adding largely to the number of beef cattle. In the year 1907 beef sold at a fair price. It is much higher now, but with the number of cattle 15,000,000 below what it was then and the number of consumers 6,000,000 more, it will take a good many years to "glut" the market, if it may ever be done. It is not likely at all that it ever will be.

The farmer with a good sized herd of beef cattle has something surer and safer than a gold mine. He has that for which millions of people will gladly exchange their gold. He takes no manner of risk; he cannot lose money unless his cattle might die. He has that which is better than gold, and in having it he constantly improves his soil and adds steadily to its productive capacity. It will take years of time for farmers to increase the supply of beef so as to approach approximately the demand, for while the herds are increased and the cattle are multiplied, population will go on increasing, and there will be no reduction of demand.—*Knoxville Journal and Tribune*.

FARMER'S OPPORTUNITY.

The movement of the big beef packers at Chicago to raise beef cattle as an individual side line as the only effective method of reducing the present price of meat is timely and to the point.

We must raise and fatten more cattle, hogs and sheep, also more poultry, else we must cut out the meat diet. The slaughter and shipment of calves must stop. Unless there is something done, some legislation enacted prohibiting the shipment of the young calves for veal from the farms, many sections of the country will in a short time be found so free from cattle that not even a good cow for breeding, milking or beef purposes can be found. The rapid increase of the meat-eating population and the increased consumption of meat by the vast army of people who are steadily increasing their income in one way or another, and who are consequently able to indulge to a greater extent their appetite for meat food, coupled with the constantly diminishing supply of meat production, is bound to force prices of all kinds of meat and poultry higher year by year. Then, how are we going to remedy this matter? We must stop the slaughter and the shipment of calves. We must keep them on the farms until the number of cattle are sufficient and the quality of breeding is brought up to such a standard that there will be a profit to the raiser worth the while when he makes a sale. More than that we need them for home consumption. We must raise more sheep and hogs and even more poultry. There is no better grazing lands for sheep and cattle than those to be found in the hill country of this section. As for the hogs, they, like the cattle, have been shipped out of the country to be slaughtered by the meat packers in the East and West until the meat supply for home use is even very deficient. And yet we have the finest section for hog raising to be found. We raise large acreages of corn, which with plenty of

woodland range, supplying usually large quantities of acorns and chestnuts, puts us in the forefront as a hog-raising section. As to poultry, too much can't be said for this Southern country along this line. All that is needed is for more people to indulge in the raising of more chickens, turkeys, etc., and thereby assist in solving this question of reducing the price of meat. Those who have engaged in poultry raising have made a killing. The climate is thoroughly adapted to the industry, while the expenses attached to it are small compared to other products raised on the farm, thus making the profits larger.

There seems but one way out of the difficulty, a way that will not only mean much to the producer's pocketbook, but will help greatly to regulate the price of meats of this country, and that is for the farmers to raise more cattle, more hogs, more sheep and poultry. When this is done our local markets will be supplied by home-grown products and better conditions generally will exist. The local produce men, it has been demonstrated during the past ten years, are too vigilant to permit this market to become glutted or even supply the insatiable demand.

In this ideal climate we should raise an abundance of alfalfa, which is splendidly adapted to this section. Raise alfalfa and feed it to your hogs, cattle, sheep and chickens. You will always reap a splendid reward for your labor if you thus diversify your farm products. There is ample opportunity in East Tennessee to produce not only enough of all of the above products for yourself but an abundance for others. When this is done the present meat price question will have been solved and logically so.—*Johnson City Staff*.

APPLYING LIME TO GROWING CROPS.

A reader wishes to know if he "may apply ground limestone to growing clover, newly sowed oats and clover and rape and oats, the land on which the rape and oats are growing to be sowed to alfalfa this fall."

The place for lime or limestone is in the soil, not on it; but since these crops are on the land they will not be injured by the ground limestone and will probably be benefited, or at least some of them will, by scattering it over the surface.

This limestone should have been applied last fall before sowing any of these crops. As soon as the rape and oats are grazed off, the limestone should be well worked into the top soil a month or two before sowing the alfalfa.—*The Progressive Farmer*.

AGRICULTURAL CREDITS.

The Farmers' Society of Equity, which met in annual session in Indianapolis recently, declared that any credit system for farmers should not be controlled by the money interests. The society was right, and that is just what the sub-committee is seeking to do—to get at a system which will be supervised by the government without in any way hampering or injuring general business.

The society also deplores the lack of cooperation among American farmers. This is a trouble peculiar to the farmers. They should cooperate and see to it that they are given the same avenues for credit as the manufacturer or merchant.

The resolutions on farm mortgages and credit schemes passed by the society refer to the movement in this country for cheaper money for farmers, the plan being to mortgage the farms and issue bonds thereon that can be sold in the markets of the world. It is pointed out in the resolutions that in some European countries such credit or bond scheme is very popular, but that the farmers in those countries are organized, and control the system and own the banks from which the loans are made, thus controlling both the bonds and mortgages, while in this country they are not organized in such a way that they can control the mortgages and bonds.

To give the farmers control of their own bonds and mortgages is exactly what the advocates of cheaper credits for American farmers are after. It is proposed that the farmers organize into co-operative societies, establish their own mortgage banks, then have the federal and state governments enact such laws as will enable such institutions to clear through governmental controlled banks, in groups, and thereby obtain funds at nominal rates in order to be able to lend money at reasonable rates.

Of course, if the Aldrich plan, or any plan that places the credits of the nation in the hands of the money power, is adopted, it would be hard for the farmers, or any other class, to control their own bonds and mortgages. The idea is not to permit the money power to dictate the financial policy of the nation.

The farmers should cooperate first. That should be their first step. Unless they show a disposition to help themselves they will find little aid from the government.—*Memphis News-Scimitar*.

Alfalfa opens up the soil for many feet down, fills it with humus and nitrogen, and makes it rich in every way, easier far to work than at first, and much better to take water.

SHEEP IN THE SOUTH.

When I first came South, I was strongly impressed with the many advantages of the Middle South as a sheep and goat country. I think that Middle and East Tennessee, Eastern Kentucky, the Piedmont region in the Carolinas, Northern Georgia, Mississippi, and Alabama, are especially well adapted to sheep husbandry.

I had been living in Kansas, where many sheep are kept and recognized at once the superiority of the Central South as a sheep-growing section. The mild climate, fine water, long summers, short winters, with much natural pasturage makes an ideal sheep range.

After satisfying myself of its natural advantages I bought nearly three thousand acres of gently rolling land near Tullahoma, Tenn. Numerous living springs, never dry, furnish an abundance of finest water. While sheep do not require much water, what they do have must be of the best. Extra good natural pastures abound. The only drawbacks I have found was the lack of skilled sheep men to handle them, and the ravages of dogs.

It seems strange to me that any legislature composed of sane men should fail to see the advantage of millions of dollars worth of sheep and goats to our States, as against the privilege of the few men to roam over the State behind a worthless dog and a shotgun for "sport."

In most other States and in every other vocation or walk of life a man is held strictly responsible for the acts of himself or his agents. If a railroad train or an automobile runs over a hen or a cow somebody is held responsible for it; but in Tennessee a man may keep a pack of worthless dogs to do his neighbors hundreds or thousands of dollars worth of damage with seeming impunity and immunity.

After very heavy losses by dogs, my books showed a profit of about 20 per cent on the sheep, which is far below what it should be. With proper handling, sheep should show from 50 to 100 per cent clear profit, allowing that the manure will balance the expense of care, which it will do fully.

Now that we are to have "free wool" for a time, the mutton breeds are the only ones promising a profit, and a man should be able to buy sheep at very reasonable prices now. I once had a neighbor named Smith. When the farmers about him were crazy about dairying Mr. Smith sold his cows for good prices and bought sheep cheap. When the government put a tariff on wool, and the other farmers wanted sheep, Smith sold them his sheep for good prices and bought cattle cheap. He never sold hay at less than \$20 per ton, usually buying stock to feed it to if he had a surplus. I hardly need remark that Mr. Smith got rich, very rich for a man in his location and vocation. I think now is a good time to start in the sheep business. Free wool will scare out many wool raisers, and a man should be able to buy at low prices. And by the time a man could breed up a flock and get well started in the industry we are liable to have a new Congress and President who are willing to allow us to raise wool in the United States instead of paying Australia or South Africa to raise it for us. It has worked out that way several times before.

Mutton sheep will pay fairly well no doubt with free trade in wool. The Southdowns or Southdowns crossed on Shropshires have been our favorite breed for mutton sheep. The Oxford is also a fine mutton sheep and carries a fine, heavy coat of medium wool. The Leicestershire and Lincolns are large sheep, long legs and coarse wool, but not much known in the South.

The late Col. Killibrew, one of the best-posted men in Tennessee, told the writer ten years ago that Tennessee could raise easily \$20,000,000 worth annually of sheep on lands now producing nothing, or in addition to the stock now produced, if the State would protect the flocks from dogs and the farmers would only learn to raise sheep. Raising sheep is a trade, and if a man is too dull or too lazy to learn the trade he had better keep out lest he gets his fingers burned, or finds a hole in his pocket.

There are thousands of sheep kept a few in a place with little or no especial care given them. If they are good hardy sheep they may show a good profit even kept in that way. The Angora goat will thrive with little care. If a sheep does so it is the exception. Sheep need regular feeding and more and better feed than the goats do.

If the sheep are starved the wool will show it in weak, thin spots in the fiber. To raise fine sheep they need plenty of good clover, alfalfa or soy bean hay in the winter. The natural pasture is good from April to August. They sometimes get too dry and hard, and the pasture needs supplementing with clover, alfalfa, rape, sorghum or other artificial feeding. It is imperative that the sheep should be changed in the pasture about once in two weeks in the summer, unless they have a very large range. Small pastures and frequent changes are best. Then they do not poison the grass and become sick.

Sheep should not pasture with cattle, horses or mules, as they bite the grass so closely as to starve the other stock.

Good sheep well cared for should show 75 to 100 per cent profit per annum. Scrub sheep, well, I don't know how much loss they should show, but I guess a right smart.

For winter feed sheep need the best of clover or alfalfa or good roughage and grain. Some feed the sheep on silage through the winter with good results. Some Illinois farmers put steam pipes in their silos intending to partly cook the silage. It did not work well and was soon abandoned. We thought that cottonseed meal killed some of our sheep and goats. Corn and oats ground with a little linseed meal or shorts and bran with linseed meal are the best supplements for poor pastures. Spring lambs, like baby beef, are rapidly gaining in popular favor, cost less than mature animals to fatten and profit more.—*Alton M. Worden, Altamont Range, Tullahoma, Tenn., in Shelbyville Gazette.*

A bran mash and a day in the pasture will be good for the horse off his feed.

CARE IN FILLING SILO DETERMINES SUCCESS.

Any type of silo is better than none at all. Sometimes when I look over the farms of this community, count the silos, and do a little rough estimating on the amount of foodstuff saved annually, I wonder if the tall "pickling towers" will not go further toward solving the big agricultural problem than anything else.

When a farmer builds a silo he must first decide between the wood, brick and the concrete types. It is the most natural thing in the world for the man who is selling a certain type of silo to argue that it is better than any of the others. As a matter of fact, each of the silo types has some advantages over the others, either in economy of building, ease of construction or durability.

I have grown intimately acquainted with at least two silos. I have a concrete structure built alongside my horse barn and a wooden silo near the cattle shelters. Both are excellent. One will keep silage fully as well as the other if I do my part of the work. After all, in putting away silage for feeding, a good deal of log-cabin sense must be used along with plenty of hard work and a considerable capacity for taking pains.

For the life of me I cannot see that a concrete silo keeps silage any better than the wooden one, or that the wooden silo furnishes me a better variety of forage than the one built of concrete. If you put away the green truck properly, either type will do its part of the work as well as can be expected.

Naturally, where a man has a very limited amount of capital that can be put into a silo, it may be better for him to put up a cheaper one. Personally, I would rather do this than to slap a mortgage on the farm or give some country money lender my note at a high rate of interest. Where the money can well be spared it will pay to put up a silo of the most enduring type.

A lot of silage is spoiled by putting it up when it is too green. When we first began using the silo we made this mistake pretty often, but experience has taught most of us better.

Green silage is harder to handle than that which is too ripe and dead. It is always possible to add enough water to bring the cut vegetation back to the proper amount of succulence.

Carelessness in packing away the silage causes a lot of trouble. The man inside must be willing to work hard. So far I have never seen a piece of distributing machinery that could be relied upon to do all the distributing by itself.

Pack and pound silage around the rim of the silo if you want it to keep well. Leave as little space for air as possible between the silage and the outer walls, as air spaces mean spoiled and blackened silage.

The corn, or whatever is being used as a silage filler, must be cut and chopped rather fine if the quality is to be high. This will make an even distribution possible, and fine silage can be packed and tamped slightly around the wall. Tamping it down is about the best known method for driving out all the air spaces around the walls.

The real consideration in silo building is not the type, but that one of some kind should be built. See that the one chosen is properly built and then use plenty of care and thought in filling it in and the result will be satisfactory.—Z. H., *Missouri*.

COMBAT DISEASES AND PESTS.

The loss incurred from plant diseases is often underestimated by the farmer; passes unrecognized, or is regarded as natural and inevitable. As a matter of fact plant diseases are exceedingly destructive, and the difference between profit and loss on a given crop is often traceable to the way in which the plant diseases are handled. In general, plant diseases may be described as including all rots, molds, blights, mildews, rusts, smuts and spots of various kinds. Many of these depreciate the value of the yield or cause its loss during storage. Leaf spots, blight, etc., reduce the amount of green matter of the leaf, and thereby reduce the starch-making power of the leaf. The purpose of the leaf is to produce starch, to nourish the wood, twigs and fruit of following months and years. If the green portion of the leaf and its starch-producing power be destroyed future yields must suffer accordingly.

There are several hundred serious and injurious plant diseases. Of these many can be prevented by proper treatment, although, of course, there are many others for which no satisfactory treatment is known.

Wherever fruit or truck crops are raised commercially we now find that spraying forms part of the care of the crop just as much as does tillage, pruning and fertilizing. Spraying is a necessity to the profitable growth of these plants. Many people object to the idea of spraying, saying that their grandfathers could raise abundant good fruit without spraying. This may be true, but we of today cannot do it.

Diseases have increased in number. Many have been imported into this country from foreign countries. Diseases which prevailed in only one or a few states now spread over the whole United States. Diseases which were formerly trifling in injury have increased to be very injurious, so that the crop producer of today must face the fact that to raise profitable crops he must take steps to prevent plant diseases. In many instances an outlay of a few cents gives a return of several dollars. Orchards entirely useless are frequently made productive by proper treatment. Every farmer should gain knowledge concerning the chief diseases of his crops, and should equip himself to fight them.

Molasses has about two-thirds the feeding value pound for pound of corn, although an accurate comparison cannot be drawn because the one nutritive element in molasses is sugar. Molasses has a slight value owing to its palatability and that it makes other foods more palatable. It is doubtful whether one can afford to pay over 75 per cent as much per hundred pounds for molasses as for corn.

SANITATION IN THE COUNTRY.

The duties of the country school teacher are many, even if his remuneration is no more than that of the average unskilled day laborer, frequently not as much. In addition to teaching one youngster in the room that two and two are four and the very next moment conducting that pupil's deskmate into the mysteries of compound-complex fractions, the rural pedagogue must often have a liberal education in janitorship and must, in many cases, be well versed in the intricacies of woodchopping in order that the school building may be kept well heated. Dr. Charles E. North, a New York expert on sanitation, adds another duty to the list. He says that the country school teacher should be a public health educator.

The United States Bureau of Education has endorsed the views of Dr. North along this line, contending that "as the natural intellectual leader of his community, the rural teacher can do in the country what the medical inspector and school nurse are doing in the city—point the way to clean living."

In many of our rural schools the teacher would not find it difficult to get a start in the work. He might begin by opening the windows of the building every morning for a half hour before the opening of school in order to allow the room to be filled with fresh air. Then he could turn his attention to the water, seeing that it be kept pure and clean and fit for his pupils to drink. At the noon hour he might find enough ideas for a long course in practical health instruction if he would notice some of the lunches brought by his pupils. Heavy eating of freshly cooked warm food is bad enough for children in the middle of the day when they must return almost immediately afterward to their studies, but the cold lunches consisting of jam, biscuit, ham, etc., are among the most lamentable features of rural school life. They retard the mental and physical capabilities of the students. Since lunches of some kind are necessary, and since it is also true that they must usually be brought with the pupil in the morning, the teacher might urge care in selection and moderation. Fruit and pure milk should be the prominent items.

After the country teacher has exhausted the ideas to be pressed upon the pupils as regards their school life, it would be an excellent thing for him to take up the work of sanitation as urged by Dr. North. He says:

"In rural communities annually 400,000 persons die and about 2,000,000 others are seriously ill from infectious diseases. If only one-half of these deaths and cases of sickness can be eliminated it

means that an immense field of useful work lies at the hand of the country school teacher who will become a public health educator, and will instruct the children and the mothers and fathers how to prevent the transference of poisonous bacteria from those who carry them to those who do not."—*Chattanooga News*.

TO SPEED THE PLOW.

There is a palpable tendency to improve the agricultural conditions of the country, not only here, but in England. To speed the plow seems to be the desire of all who realize that it is the farm upon which nations must depend for national prosperity.

The newly issued report on conditions in rural England, prepared by a land inquiry committee in sympathy with the existing government, asserts that there is a shortage of 120,000 houses for rural laborers and their families. So bad are conditions in this respect that in many neighborhoods young people cannot get married until after years of waiting because there are no houses for them to live in.

This seems a startling statement to make, for the English farmer has always been regarded as having been exceptionally blessed.

David Lloyd-George, the British Chancellor of the Exchequer, who prompted the investigation, has thoroughly aroused all England. His land agitation has now started a trend of discussion which, like all great movements, seems destined to stir the entire country.

Lloyd-George very clearly lays down his views. He declares that the plow must be brought back to many thousand tillable acres that are now out of cultivation. He will seek to disinherit the pheasant and evict the hare.

Land barons of old England, in their greed for hunting preserves, have vast acres, which should be affording plenty to the English people, idle and uncultivated.

Lloyd-George tells the people of England that the farm laborer is now worse off than he was in former centuries when he was a freeholder in the land, had commons on which he could graze his cows and a plot for grain and vegetables.

Abundance of the best labor, declares the Chancellor, must be drawn back to the land by a living wage, shorter hours of work, comfortable houses in which to live and little patches of land to cultivate.

The prosperity of every country depends upon the soil. Great manufacturing industries do much to further a nation's prosperity, but the foundation rests on the farm, and it is to the agricultural improvement that first attention should be given.

Such a movement has been consistently urged in the United States, and the result is being convincingly shown.

It is the purpose of Lloyd-George to have the government actively assist the tenant farmer in providing homes for their labor. This is at least one step in the right direction.—*Memphis Commercial-Appeal*.

WEIGHTS OF SEEDS OF LEGUMES TO MAKE A BUSHEL.

Alfalfa	60 pounds
Alsike clover	60 pounds
Bur clover (in burs)	10 or 11 pounds
Canada field peas	60 pounds
Cowpeas	60 pounds
Crimson clover	60 pounds
Lespedeza, Japan clover (unhulled)	25 pounds
Melilotus, sweet clover (hulled)	60 pounds
Peanuts	22 to 28 pounds
Red clover	60 pounds
Soy beans	60 pounds
White clover	60 pounds

LEGUME SEEDS REQUIRED TO PLANT AN ACRE.

Alfalfa	15 to 25 lbs.
Alsike clover (alone)	8 to 10 lbs.
Alsike clover (in combination)	4 to 6 lbs.
Bur clover (in burs)	15 to 40 lbs.
Canada field peas (alone)	1 to 1½ bu.
Canada field peas (in combination)	3 to 4 pks.
Cowpeas (broadcast)	1 to 1½ bu.
Cowpeas (in drills)	2 to 4 pks.
Crimson clover	10 to 20 lbs.
Lespedeza—Japan clover (unhulled)	25 to 50 lbs.
Melilotus—Sweet clover (unhulled)	15 to 30 lbs.
Melilotus—Sweet clover (hulled)	8 to 10 lbs.
Peanuts (hulled)	½ to 2 pks.
Peanuts (unhulled)	1½ to 2 bus.

—The Progressive Farmer.

TENNESSEE FAIR DATES FOR 1914.

POSTOFFICE	COUNTY	DATE	SECRETARY
Alexandria	DeKalb	Sept. 3-5	Rob Roy.
Carthage	Smith	Sept. 10-12	S. M. Corley.
Celina	Clay	Sept. 8-11	W. F. Brown.
Deer Lodge	Morgan	Sept. 22-25	T. F. Hayworth.
Dresden	Weakley	Oct. 14-17	C. B. Brasfield.
Dyersburg	Dyer	Sept. 29-Oct. 3	F. D. Haleb.
Jacksboro	Gibson	Sept. 15-18	F. M. Bledsoe.
Fayetteville	Anderson	Sept. 23-25	H. C. Cox.
Jackson	Madison	Oct. 5-10	W. F. Barry.
Kingston	Roane	Sept. 15-18	Sam R. Sparks.
Memphis (Tri-State)	Shelby	Sept. 26-Oct. 3	F. D. Fuller.
Morristown	Hamblen	Oct. 6-8	R. F. Taylor.
Murfreesboro	Rutherford	Sept. 9-11	B. B. Kerr.
Nashville (State)	Davidson	Sept. 21-26	J. W. Russwurm.
Newport	Cocke	Oct. 13-15	J. M. Jones.
Paris	Henry	Sept. 20-Oct. 3	R. H. Hudson.
Selmer	McNairy	Oct. 20-23	W. K. Abernathy.
Spring City	Rhea & Meigs	Sept. 22-25	J. R. Fischeffer.
Shelbyville	Bedford	Sept. 2-4	W. E. Gant.
Sweetwater	Monroe	Sept. 29-Oct. 2	J. F. Childress.
Union City	Obion	Sept. 9-12	J. W. Woosley.
Winchester	Franklin	Sept. 1-4	J. F. Vaughan.

CROP REPORT FOR AUGUST.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., September 1, 1914.**

Correspondents in eighty-two counties reported to the department on crop conditions for the crop month ending August 20. The general rains throughout the State materially improved crop conditions, and the report for August is much better than for the preceding month.

Cotton is reported in fairly good condition, and the prospects are for an average crop. In some parts of West Tennessee farmers are still needing rain. Cotton is excellent on the bottom lands.

Tobacco has improved, although the production will not likely equal that of last year. The yield of peanuts will also likely show a decrease.

Rains during the month of August greatly helped corn, and the reports on this crop are much more encouraging than for July. The indications now are for at least a three-fourths crop in the State, and possibly more.

The encouraging feature in Tennessee agriculture this year was the large wheat yield. The hay crop was cut short by the drouth in the early part of the season, and the Irish potato crop was practically destroyed.

The renewal of pastures caused by rains during August is a great help to live stock, which is reported in fairly good condition.

Following is the summary, for comparison, of the reports of the Department of Agriculture for the month of August, 1913 and 1914:

	1913 Per Cent	1914 Per Cent
Cotton, condition	81	79
Millet, condition	65	76
Corn, condition	63	76
Tobacco, condition	69	72
Stock peas, condition	67	77
Sweet potatoes, condition	71	78
Sorghum, condition	72	80
Tomatoes, condition	68	77
Peanuts, condition	77	73
Clover, condition	58	61
Live stock, condition	84	87
Alfalfa, condition	80	75

Cumberland Plateau.

[illegible]

TENNESSEE AGRICULTURE

AUGUST CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.												
		Cotton—condition.	Millet—condition.	Corn—condition.	Tobacco—condition.	Stock Peas— condition.	Sweet Potatoes— condition.	Sorghum—condition	Tomatoes—condition	Peanuts—condition.	Clover—condition.	Live Stock— condition.	Alfalfa—condition.
G Central Section of East Tennessee.	Claiborne	...	70	85	...	60	70	75	90	...	50	70	...
	Hancock	...	90	90	74	84	94	75	92	...	73	97	...
	Anderson	...	45	83	100	80	100	100	100	...	100	93	55
	Granger	...	65	73	60	78	75	68	88	...	65	83	...
	Union	...	83	95	...	83	83	90	90	...	80	95	...
	Knox	...	...	...	...	...	...	...	...	...	...	...	...
	Khea	...	...	90	...	90	70	88	75	...	60	90	...
	Roane	...	75	83	...	80	73	75	65	...	58	93	65
	Loudon	...	80	80	...	75	75	100	100	...	60	100	...
	McMinn	...	85	76	...	85	85	70	73	...	75	86	...
	Meigs	...	88	83	...	88	90	93	85	...	90	93	90
	Bradley	...	100	100	50	90	90	100	70	...	80	40	30
	Hamilton	...	70	65	...	80	75	...	75	...	50	60	...
	James	...	...	...	...	...	...	...	...	...	...	...	...
H Mountain Section of East Tennessee.	Johnson	...	60	82	50	60	75	85	98	...	70	85	73
	Sullivan	...	...	75	...	...	...	...	...	...	...	...	...
	Cartier	...	80	80	...	78	88	80	90	...	74	88	83
	Hawkins	...	50	84	...	79	65	77	89	...	65	87	80
	Washington	...	100	90	90	100	100	100	100	...	60	80	...
	Unicoi	...	...	...	...	...	...	...	...	...	...	...	...
	Greene	...	95	52	84	75	80	88	85	...	82	88	75
	Hamblen	...	84	85	80	63	70	83	85	...	63	88	63
	Jefferson	...	93	100	90	88	98	98	95	...	80	93	100
	Cocke	...	85	90	90	88	90	90	95	...	78	95	95
	Sevier	...	85	84	...	85	81	87	87	...	90	72	92
	Blount	...	...	85	...	85	90	90	85	...	80	95	85
	Monroe	...	95	100	...	100	85	100	100	...	80	95	95
	Polk	...	40	90	50	100	80	90	60	...	70	40	100
General average		79	76	76	72	77	78	80	77	73	61	87	75

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IN THIS ISSUE:

Agricultural Special Ends Tour.

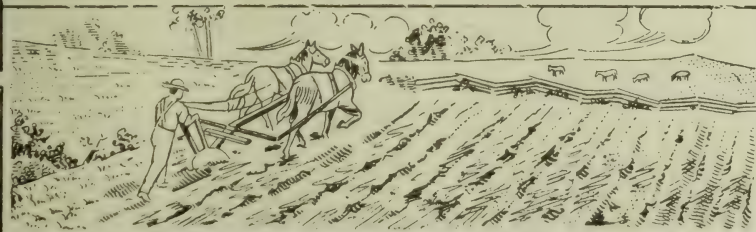
Eradicating the Wild Onion.

A Visit to the Agricultural Special.

West Tennessee Farmers' Institute.

Legal Weights and Measures.

September Crop Report.



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A Magazine Devoted to the Conservation and Development of the
Agricultural Interests of Tennessee

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THOMAS F. PECK, Commissioner

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Department of Agriculture.

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A. L. GARRISON, Chief Feed, Seed and Fertilizer Inspector.
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AGRICULTURAL SPECIAL COMPLETES TOUR.

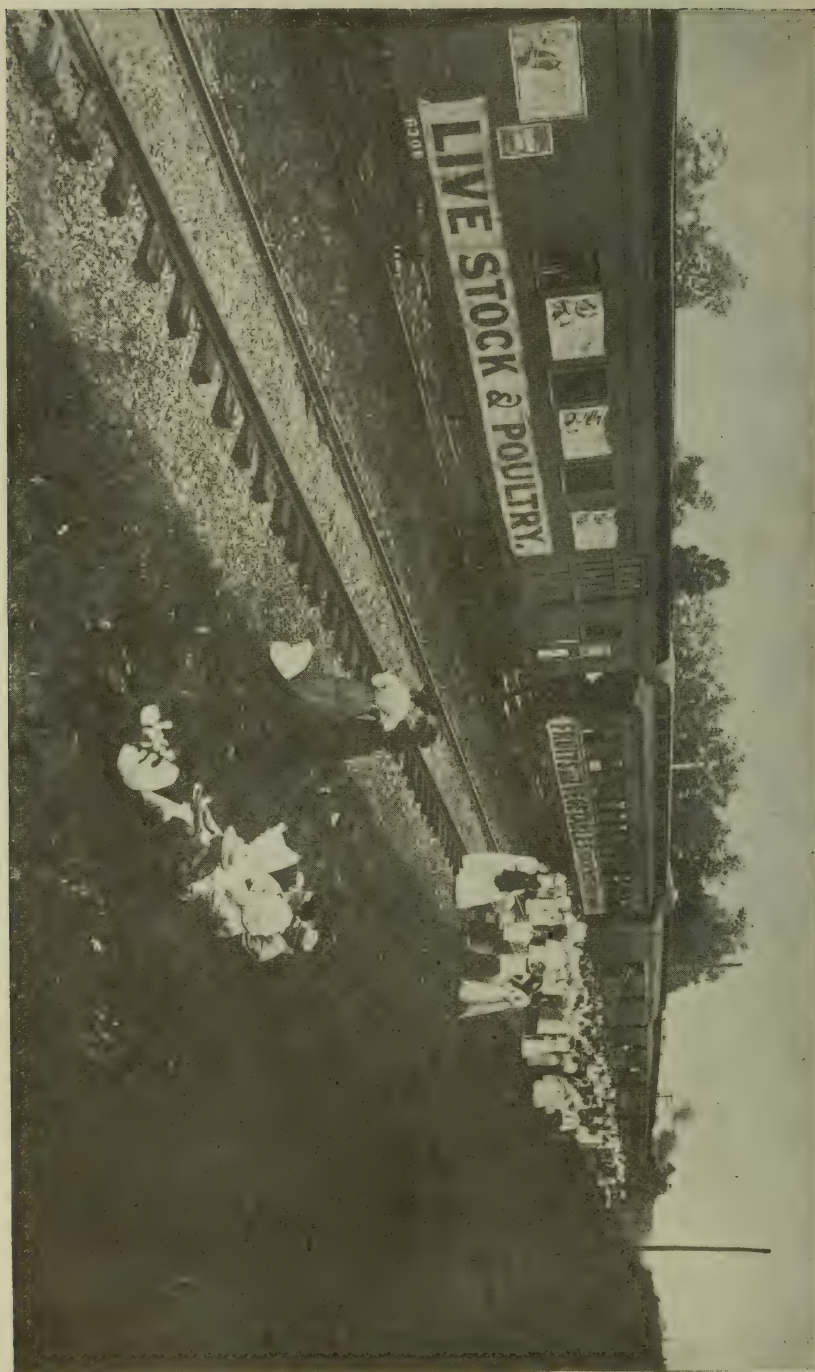
BY T. F. PECK.

Now that the tour of the Agricultural Special has been completed it will not be out of place to say something about the plant, its object, and what was accomplished. Anyone who is observant knows that while much valuable information has been worked out that the farmers should have the benefit of, its method of dissemination in the past has not been such as to reach the backward and indifferent farmer who needs it most. We know also that in the past we have not done all we could do to acquaint Tennesseans with the splendid resources and possibilities of our State. We have lost thousands of Tennesseans who have emigrated from this State, and have contributed much to the prosperity of the Southwestern States, who could have been retained in Tennessee if a reasonable effort had been made to let them know the wide range of products that can be so successfully grown, and the splendid markets we could develop for the fine quality of products we can grow.

So when I assumed the direction of our State Department of Agriculture I immediately undertook the work of getting in touch with the people who needed this information, and have tried to get them interested in the need of better methods in farming by placing the facts that have been worked out in plain, simple terms that they could understand and put the lessons in practice on their own farms, knowing that the lessons and work would be no less valuable to the wideawake, progressive farmer.

I believe that an exhibit such as the one carried on the Agricultural Special, showing the wide range of products, the superior quality our soils are producing, the true types of the different breeds of live stock, together with an exhibit from our educational and health departments, touching in a practical way everything for the betterment of rural life conditions with practical lessons and demonstrations, the novelty of the movement would induce thousands to visit the train and secure their interested attention and make it possible to do most effective follow-up work.

Now that the tour is finished, I am thoroughly convinced that the good results will far exceed our fondest expectations. We started out on July 15, and finished on September 17. In that time the train traveled over 10,000 miles; we made over 350 stops, and more than 500,000 people passed through the train. I have never seen anywhere people more interested or eager for information. While we worked daily from 4 o'clock in the morning until 10 o'clock at night for prac-



tically nine weeks, we could not reach all the places where we were petitioned to stop, and could not stay as long as we wanted and should have stayed, and I am sure the only criticism, if any, that might be made of the train was because of the short time spent at the different stops and the haste necessary to get the crowds through in the time. This we regretted more than the people, but when it is remembered that the work was a volunteer movement undertaken by the department forces cooperating and without additional compensation, I think



Agricultural Train on Illinois Central in West Tennessee.

every fair-minded person will forego any criticism for the hurry that was imperative and could not be avoided.

NO EXTRA COST.

It should be remembered that the movement was planned and executed without one additional cent of expense to the taxpayers of the State.

This was made possible by the broad, cooperative and progressive business policy of the railroads operating in Tennessee. Knowing that the departments cooperating in the movement had no available funds for such work, every railroad organization operating in Tennessee cheerfully lent their cooperation by furnishing cars, and the road on which we were traveling furnished the engine and train crew, and in almost every instance, a trainmaster and division superintendent.

The N., C. & St. L. Ry. furnished a sleeping and dining car, both completely equipped in every way, and a portion of the time a gondola

car for carrying limestone rock, and all the cooperation of the railroads was given without one cent of compensation. Their action was taken without any sentimental reasons, more than any individual should have, but rather as a broad-minded business policy, recognizing the fact that if the people along their lines were stimulated to better methods in farm practice, resulting in more production and prosperity for the farmers, that they would share in that prosperity.

The railroads' managements know that it is poor business policy to "kill the goose that lays the golden egg"; that it is the prosperous people along their lines who provide the golden eggs.

Farmers of Tennessee are waking up to their opportunities and are going to profit by them. They appreciate the efforts in their behalf, and if the practical common sense methods to help them are continued, Tennessee will soon take her place as the most progressive and prosperous agricultural State in the South, and when the history is written it will be found that the Agricultural Special of 1914 has played an important part in the awakening to better methods in farm practice and stimulating to better home life conditions on the farm.

THE TENNESSEE STATE FAIR.

The Tennessee State Fair for 1914 was held during the week of September 21-26, and was the best exhibition ever put on since the Fair became a State institution. The Board of Trustees and their Secretary, J. W. Russwurm, had done everything possible to make this fair a success, which it was in every way except financially. The heavy rain on Wednesday, which was Nashville Day, cut down the attendance on that day, and materially reduced the receipts, and probably resulted in the fair showing a deficit for the year 1914. However, this was fully covered by the guarantee fund subscribed by the business men of Nashville.

A valuable farmers' bulletin (No. 597) just issued by the United States Department of Agriculture treats of the road drag and how to use it. That our fall and winter hauling may be done over better roads and at less expense, it is important now that we begin to arrange for road improvement. In this work few implements will be found less expensive and more efficient than the King road drag. Write the Secretary of Agriculture, Washington, D. C., for this free bulletin, and prepare to live on and travel over highways that are a little more than roads in name only.—*The Progressive Farmer*.

ERADICATING THE WILD ONION.

BY T. F. PECK, COMMISSIONER OF AGRICULTURE.



From time to time inquiries have come to the Department of Agriculture as to the best methods of eradicating the wild onion, or garlic, which has caused great loss to the farmers of the country. A recent bulletin issued by the United States Department of Agriculture treats on this subject, and contains some very valuable advice and suggestions.

The measures recommended for the eradication of the wild onion, or garlic, pest are based on the growing habits of this plant. It ripens in June or July, when it has a stem 1 1-2 to 3 1-2 feet tall, on the top of which are found clusters of the aerial bulblets, incorrectly called

seeds. The plant seldom produces true seed. It multiplies by forming 2 to 6 new bulblets, which start to grow after the leaves and stem die.

To kill the wild onion, the work must be started in the fall to destroy the plants from the soft-shelled bulbs before they produce new bulbs. The best time is when the new plants are 12 to 15 inches high, or during October and November, in the South, and November and December, in the North. At this stage the land should be plowed fairly deep, turning under all the onion tops. The tops should be completely buried by the plowing, and for this reason a plow with a jointer attached to the beam will often be a great help. Disking the land previous to plowing will also aid in burying the tops. The following spring the field should be planted in a cultivated crop, corn in check rows being best. Another shallow plowing may be necessary in the spring, but ordinarily a disking or two previous to planting will suffice. In cultivating the corn, the effort should be to kill the onion plants that spring up, and the easiest way to do this is to cut off the tops. Cultivators of the sweep type are the best. On many of the modern cultivators sweeps 8 to 18 inches wide may be quickly attached in place of the shovels. Some soils, of course, are too stony or otherwise unsuitable for the use of sweeps.

From the time the farmer is able to get on the land in the spring until the corn is laid by he should direct his efforts towards preventing the onion from taking top growth, with the idea of killing the plants that come up from the hard-shell bulbs. If this is well done, most of the onions will disappear by the end of summer. Some of the hard-shell bulbs, however, may delay germination for a year or two, so that by fall a few plants may again be in evidence. The farmer, therefore, should be prepared to follow the same plan of deep plowing late in the fall, succeeded by a carefully cultivated crop the next spring. In two years this treatment is almost sure death to all the wild onions in the land, and the work can be carried on with but little extra labor and expense. The aerial bulbs germinate in the early fall, but the plants are weak and readily destroyed by fall plowing. Many farmers have tried the method outlined here and have found it to be entirely satisfactory.

If grass lands are quite full of the onions, the easiest way of disposing of them is the cultivation method. In fields where there are only a few plants, the most feasible method is to dig the plants or clumps with a mattock. Four thimblefuls of coal-tar creosote oil put on a plant will kill the ungerminated bulbs. Still, the mattock method is best, as one well-directed stroke, when the soil is moist and soft, will take out the entire clump by the roots. These should be carried off where they can give no further trouble. It is then a good plan to fill the hole with soil and sprinkle a little grass seed on the surface. Sheep eat the tops of the onion, and grazing for a few years is reported as an efficient remedy for the pest. Sheep apparently eat the onion most during the winter and early spring, when there is little other green vegetation, or in poor pastures, where there is little to eat but the onion. On the better pastures it may be necessary to salt the onions occasionally to give the sheep a taste for them sufficient to overcome their natural dislike.

As the aerial bulblets are practically the only means by which the onion pest is distributed from field to field and farm to farm, it is highly important to prevent their formation. Cutting the tops of the onion plants before they are ripe will prevent the formation of these bulblets.

The fowl on exhibition is very often a painted bird; his legs are lightly coated with iodine to bring out the color, his comb, face and wattle have received a generous coat of vaseline to show up its brightness, and the feathers are well washed with soap and water.

A VISIT TO THE AGRICULTURAL SPECIAL TRAIN.

BY A MAURY COUNTIAN.

A TRIP TO AND THROUGH THE AGRICULTURAL SPECIAL AT COLUMBIA, TENNESSEE.

My attention was first called to the fact that all visitors would enter from the flat car at the rear, known as the machinery car. After the crowd had assembled, Col. Jesse Tomlinson, Assistant Commissioner of Agriculture for Middle Tennessee, in a few words introduced Capt. T. F. Peck, Tennessee's efficient Commissioner of Agriculture, who for ten or fifteen minutes spoke in his plain, characteristic, convincing manner. At the conclusion of Capt. Peck's interesting talk we were invited to enter the train and observe the interesting exhibits. On the machinery car was installed a Jeffreys rock crusher, capable of grinding thirty tons of agricultural lime per day, and were informed that practically all Tennessee soils need lime.

Attention was called to the fact that after the crowds had passed through, this machine would be placed in operation and crush some local limestone. There was also on this car turning plows and subsoil plows and a complete electric lighting plant, which I was told was used for lighting the train for night meetings and the convenience of those operating the train. One could not fail noting the possibility of this plant for lighting small compact towns and large business plants.

By this time we were entering the live stock car, where we were able to glance at blooded live stock of all breeds, including Hampshire, Durocs, Poland China, Berkshire and Chester hogs; Shorthorn, Hereford and Aberdeen Angus beef cattle; Jersey, Holstein and Guernsey dairy cattle. Several breeds of sheep, crowing roosters and cackling hens galore.

As we enter the fruit and vegetable car we are astonished at the statement that there are 30,000 beekeepers in Tennessee, and that this industry can be made the most profitable side line connected with farming. A display of sprayed and unsprayed fruits was convincing evidence that pruning and spraying pays in fruit culture. A collection of economic insects was very interesting. A few statements relating to the cold water process of canning caused a block in the aisle.

After a few insistent calls, "Ladies, please don't block the aisle," we were finally able to pass to the next car, known as the soils and crops car. In this car we were met with the pleasing statement that all crops shown were grown in Tennessee, that State which we are proud to acknowledge as the best State in the Union. We are not in this

car long until we are firmly convinced that Tennessee can grow a greater variety of crops than any other State. While the jam was something fierce, everybody was in good humor and it was impossible as we slowly marched on not to get valuable lessons in seed selection, crop rotation, value of lime on crops, etc. We will never forget the large map with its nine district soil types. The big twist of tobacco, the darky and his slice of watermelon made from field seed; silos, minerals, grains and grasses, make us think more of Tennessee than before we entered this car.

In the next car we were amazed at the work being done to protect the consumer against the patent medicine fakers, food adulterators, short weights, light measures, etc. It was here we saw our first hookworm. We were also impressed with the insistent plea for more



View of a Crowd at the Agricultural Train.

pure air, the common enemy of tuberculosis. The lessons taught in this car may alleviate much suffering and save many lives—who can tell?

In the next car, devoted to education, we were told of the value of properly constructed schoolhouses and were permitted to view many interesting works from the manual training departments of several up-to-date schools of the State. That from the Colored Normal in Middle Tennessee deserves special mention. We heartily concur in the suggestion that music should be taught in all schools.

We then stepped into the domestic science car, and while it may seem natural to think this car would only be interesting to the ladies,

such was not the case. Together with the convenient and modern kitchen and dining-room furniture and utensils, there was the dairyman with his modern equipment, and last, but not least, the tri-pure water distillery, which can be installed in any home, thereby assuring against impure water, the source of many contagious diseases.

On the ground again we hear a hum, we see a cloud of dust back at the machinery car, the humming stops, the lime dust is carried away and we see the same crowd that has passed through the train giving Commissioner Peck their close attention while he gives a simple, practical soil test to determine the presence of lime. These heart-to-heart talks by Capt. Peck are the most interesting features of the stop.

All too soon the engineer gives four sharp blasts, which means that the crowd at the next station must not be kept waiting. As the train pulled out we were asked if we saw the demonstration of the use of anti-hog cholera serum. No? Well, you have missed something great. How could I see it all in one short hour with the earnest admonition from everywhere and by everybody, "Gentlemen, please don't block the aisles; pass right on through."

TENNESSEE'S RESOURCES.

Replying to an article in which repeated reference was made to Tennessee, a correspondent of the St. Louis Post Dispatch gives the following interesting information concerning the natural wealth of the Volunteer State:

"Every now and then we read of some man who has become distinguished and read that he was born on 'a poor Tennessee farm.' Now one would have to travel many miles in Tennessee to find 'a poor Tennessee farm.' Take the statistics of the United States Government, for instance, concerning this little State. Turn to the year 1909 and we find that a few square miles in Tennessee raised 240,000 bales of cotton, of a value of \$20,000,000. Then we are told that the narrow corn belt raised \$60,000,000 worth of corn. This makes the same number of acres in Illinois look like a piker. California's world-wide advertised lemon and orange crop is what? Why, \$40,000,000 are the statistics. Tennessee could take a bunch of mules raised and sold in three counties and buy the whole crop of California citrus fruits. Tennessee raised 310,000 mules in 1910. Anyone that tries to buy a Tennessee corn-fed mule must pay over a hundred dollars for him. Taking the narrow strip of land called Tennessee and comparing its products with an equal number of acres anywhere else, one will find that Tennessee is the richest State in the Union. Figures tell the tale.

WEST TENNESSEE DIVISION FARMERS' INSTITUTE.

The West Tennessee Division Farmers' Institute met in Jackson on Tuesday, September 29, for a three-days' session. At the opening session about 300 delegates were in attendance. Meetings were held in the auditorium of Union University.

The session was called to order by President R. T. DeBerry. Joe D. Johnson, the Secretary, delivered the address of welcome on behalf of the city of Jackson.

One of the first numbers scheduled on the program was an address by Capt. T. F. Peck, Commissioner of Agriculture, but Capt. Peck could not be present on account of the fact that he had gone to Washington as the representative of Governor Hooper at a meeting of the Governors of the cotton-growing States who were there to confer with members of Congress on the cotton situation in the South. Capt. Peck sent the following letter, which was read to the convention:

To the Farmers assembled at West Tennessee Farmers' Institute.

GENTLEMEN: I had thought of nothing else than meeting with you and speaking to you in person, but a meeting was called in Washington for the Governors of the cotton-growing States to confer with members of Congress looking for relief to the farmers for their cotton crops resulting from trade conditions caused by the European war.

Governor Hooper has directed me to represent him at that conference, which meets on September 28, making it impossible for me to be at both places. The farmers who will attend your meeting will be largely interested in cotton, so I feel that my duty to the Governor and the farmers of West Tennessee can best be performed by attending the Washington conference. I hope the meeting will be well attended and that much good may be accomplished, and that you may discuss the question of Local Community Cooperation, because closer community efforts and keeping constantly in mind the fact that the community in which we live means more to us than all other communities in the world. By keeping this in mind we may hope to reap where we have sown in a broader sense.

With greetings and best wishes for the prosperity of the West Tennessee farmers, I am

Respectfully,

T. F. PECK, *Commissioner.*

President DeBerry, in his address to the convention, said that the attendance was small because of three facts: First, many of the cotton growers felt that they should be at home at this time and others felt

that they could not bear the expenses of the trip; second, many of them were attending the Tri-State Fair in Memphis, and, third, quite a number would arrive on the noon and night trains.

President DeBerry stated that he wanted to do all in his power to further the annual institute and the work of the West Tennessee farmer. "If we further this movement we'll have better churches, better schools, better homes, better roads and better conditions," he said. "To that end I want you to elect some good, live man as your President, and then we'll have two men at work for you instead of one.

"I want the farmers to adopt improved methods of farming. I believe that great progress has been made in this line in the last few years and I feel that greater progress is to come. It means more money to the individual, because it means a greater output for the time, energy and land involved," he said.

President DeBerry then told of the building of the West Tennessee Experiment Station, near the end of the West Jackson car line, that is nearing completion. "We had hoped that the building would be completed by this time, but inasmuch as it is not, we were extended the invitation to meet in this university auditorium and we gladly accepted. For those of you who do not know, I will state that Prof. H. A. Morgan, of the University of Tennessee Agricultural Department, told me in February of last year that the institution would spend \$3,000 on a tool house at the experiment station in Madison County, and he suggested that the West Tennessee farmers should raise a like amount and put into a fund that would erect a handsome stadium and implement house there. We have raised about \$1,500 of that amount by contributions from the farmers and other individuals and the stadium is nearly completed. We want to raise the remainder of the money at this session if possible. We are asking a \$1.00 donation from each farmer or other individual who is interested. Pay your dollar to the Secretary and he'll keep strict account of it. We want to pay every dollar we owe on the building as soon as possible," he said.

PROF. NICHOLS SPEAKS.

Prof. H. S. Nichols was called upon to explain the new arrangement for farm demonstration work in this State. He replied by saying that the United States and the State Department of Agriculture had combined, that they were cooperating practically as a unit; that the Government agents were under the direction of the bureau of extension of the University of Tennessee, and that the plan was succeeding admirably.

Prof. Nichols stressed the fact that there is great need for more interest in the domestic science work in this section. He urged that it be taken up in the farm houses of West Tennessee with as much zeal as the farmers are taking up the demonstration work.

Following Prof. Nichols' timely talk, President DeBerry appointed a resolutions committee consisting of H. P. Cullen, J. W. Purviance, W. K. Wells and S. S. Bond. He stated that he would appoint other committees later.

The convention adjourned till 1 o'clock this afternoon, when Prof. H. S. Nichols spoke for half an hour or more on the value of winter cover crops for pasturage.

Prof. H. A. Morgan spoke on "Dual Purpose Cattle;" Dan S. Combs, of Hickory Valley, on "Feeds for Live Stock," and Dr. Tait Butler, of Memphis, on "Live Stock and Their Relation to Permanent Agriculture."

At Wednesday's session, President R. T. DeBerry spoke on "Manures and Fertilizers for Truck Crops."

"Growing and Marketing Strawberries," was discussed by W. P. Wade, of Kenton, Tenn., and W. F. Hawk, of Madison County, discussed "Value of Uniform Grading."

L. M. Rhodes, well-known to every West Tennessee farmer, talked for a half hour or more on "Production and Distribution." He insisted that the farmer must learn how to sell his produce after he has raised it; that he is not getting the prices he ought to for his produce in nine cases out of ten. He pictured the future farmer in glowing colors and was warmly applauded for his effort.

The following officers were elected for the ensuing year: President, R. T. DeBerry (reelected); Vice-President, E. H. Dowdy, of Carroll County; Second Vice-President, Henry Head, of Obion County; Secretary, Joe D. Johnson, of Madison County (reelected).

At Thursday's session Dr. H. G. Hawkins, of the M. C. F. Institute, made a splendid talk on the value of education on the farm, stating that a good and great woman was absolutely essential to the success of every farm home. He insisted that the farmers could do nothing better than educate their boys and girls. His talk was warmly applauded.

Prof. G. M. Bentley, of Knoxville, State Entomologist, gave a brief but highly important talk on "Economic Insects." He stated the farmers of Tennessee were losing ten million dollars annually due to destruction by insects. He said that diversification of crops was a great asset in the eradication of insects. He recommended lead arsenate, both in liquid and powder form, as very valuable in the destruction of insects. He stated that this preparation was not dangerous to man if

judiciously used, but that it was deadly to the army worm, the cotton leaf and tobacco worms. He was asked quite a number of questions regarding the work of insects on various plants and gave ready information thereto.

A. L. Garrison, feed, seed and fertilizer inspector of the State talked for a half hour or more on "Agricultural Legislation." He stated that the laws relative to pure seed and feed were being enforced fairly well in this State, and that with the hearty cooperation of the farmers themselves they could be enforced even better. He told the farmers to demand of the broker and the merchant that the field seed be pure. He stated that it was absolutely necessary to raise the standard of field seed in Tennessee, that the farmers were facing a crisis in this line and that it was up to them to take action.

Prof. H. A. Morgan arose and stated that he wished every farmer would take to heart the talk by Mr. Garrison. He urged that they help enforce all agricultural laws. Prof. Morgan then told of some of the work being done by the agricultural department of the University of Tennessee, showing that there was more real practice there than theory.

The Committee on Resolutions reported the following, which was unanimously adopted:

Your Committee on Resolutions respectfully make the following report:

First, we congratulate the Institute on the certainty of having a place of our own on the experiment farm for our future meetings in the character of an elegant and capacious auditorium.

Second, we return our sincere thanks to Union University for the use of their elegant hall for this session.

Third, we extend our thanks for the courtesies shown by the railroads in furnishing free transportation for the delegates.

Fourth, we return thanks to the citizens of Jackson for their characteristic hospitality.

Fifth, we desire to strongly indorse the very able, earnest and untiring services of our Commissioner of Agriculture, Capt. T. F. Peck, in laboring for the farmers of the State which has resulted in disseminating information through the press and demonstration trains of lasting importance to all our people.

Sixth, we recognize the valuable services of R. T. DeBerry, Assistant Commissioner of Agriculture and President of the West Tennessee Farmers' Institute, in furthering the interests of West Tennessee farmers, and also in the able, impartial manner in which he has presided over this convention.

Seventh, we look with deep concern on the present conditions surrounding the cotton crop of West Tennessee and the whole South. We realize that unless the crop of 1915 is cut down at least 50 per cent not only the crop now ready for the market but that of next year will

be sacrificed at prices much below the cost of production; therefore be it resolved, that we agree to pledge ourselves to a 50 per cent reduction of the 1915 crop, and further pledge this institute to join heartily in any general plan agreed upon to accomplish the plan and purpose of holding the present crop and lessening the future crop.

Following the reading of the resolutions, Prof. H. A. Morgan, of the University of Tennessee experiment station, asked to amend or strengthen two of the resolutions and to add a third.

Prof. Morgan insisted that the extension of the street car system to the experiment station would be a capital idea, and he therefore offered the following resolution, which was adopted.

Resolved, That it is the earnest request of this body of farmers, after thanking the Jackson Street Railway Company for the extension of their line into West Jackson, that they at the earliest possible time extend their line to the entrance of the experiment station to facilitate the farmers of West Tennessee in getting to and from the station and the city.

The resolution was unanimously adopted and the President and Secretary of the institute were instructed to take the matter up personally with the street railway company officials.

Prof. Morgan then stated that he felt that the erection of the handsome auditorium at the experiment station was due in part to the efforts of the bankers and business men of Jackson. He then offered the following resolution, which was unanimously adopted:

Resolved, That this convention of farmers desire to return our thanks to the citizens of Jackson who have made possible the erection of this commodious auditorium for the accommodation of all West Tennesse farmers.

Going to the cotton situation resolution, Prof. Morgan insisted that the convention should send a brief telegram to every Tennessee Congressman urging him to do all in his power to gain help in the present crisis of the cotton situation. The convention ordered by a unanimous vote that such a telegram be prepared, and Col. R. S. Fletcher, of Jackson, was ordered to frame the same.

The convention adjourned at 12 o'clock *sine die*.

By all means raise chickens. Two hundred or 300 with plenty of range can be raised to advantage at very small expense because anything needed for feed can be raised on the farm. Corn and wheat make a fine chicken feed and for winter cabbage will add to the value of the ration.

Well decomposed manure is the surest fertilizer for producing a large corn crop.

THE AUDITORIUM.

All the delegates to the West Tennessee Farmers' Institute expressed themselves as highly elated over the erection of the handsome auditorium at the experiment station, just outside the city. Prof. H. A. Morgan brought up the matter at the session this morning and asked all farmers who indorsed the movement and the plan of building to rise. With one accord they arose, and a number of individual expressions of appreciation of the work of Superintendent S. A. Roberts, of the experiment station; President R. T. DeBerry, of the institute, and Prof. H. A. Morgan, for their interest in the work were heard.

With few exceptions all the delegates contributed \$1.00 to the building fund, and there was about \$300 raised at this session. Other funds had already been collected by county presidents and the amount now is approximately \$1,000. The plan is for the West Tennessee farmers to pay \$3,000 and the State to pay \$3,000, the building costing between \$6,000 and \$7,000. Jackson banks and business men advanced \$3,000 on the part of the West Tennessee farmers and the building is nearly completed. It will be ready for occupancy by the various county delegations next summer and the West Tennessee Institute in September of next year. At that session the farmers hope to have raised the remaining amount.—*Jackson Sun*.

LEGAL WEIGHTS AND MEASURES STATE OF TENNESSEE.

Apples, green shall be	2½ bu. per bbl.
Apples, green, shall be	50 lbs. per bu.
Apples, dried, shall be	24 lbs. per bu.
Apple seed shall be	40 lbs. per bu.
Blue grass seed shall be	14 lbs. per bu.
Beans, dried, shall be	60 lbs. per bu.
Beans, green, in pods, shall be	30 lbs. per bu.
Beans, green, in pods, shall be	2½ bu. per bbl.
Beans, castor, shall be	46 lbs. per bu.
Beets shall be	50 lbs. per bu.
Blackberries shall be	48 lbs. per bu.
Blackberries, dried, shall be	28 lbs. per bu.
Bran shall be	20 lbs. per bu.
Broom corn seed shall be	42 lbs. per bu.
Buckwheat shall be	50 lbs. per bu.
Barley shall be	48 lbs. per bu.
Beef, net, shall be	200 lbs. per bbl.
Carrots shall be	50 lbs. per bu.
Cabbage shall be	50 lbs. per bu.
Cherries, with stems, shall be	56 lbs. per bu.
Cherries, without stems, shall be	64 lbs. per bu.
Corn, shelled, shall be	56 lbs. per bu.
Corn, in ear, shucked, shall be	70 lbs. per bu.
Corn, in ear, with shucks, shall be	74 lbs. per bu.
Corn, green, with shucks, shall be	100 lbs. per bu.
Corn, green, with shucks, shall be	2½ bu. per bbl.
Corn, matured, with shucks, shall be	5 bu. per bbl.

Legal Weights and Measures State of Tennessee.—Continued.

Corn, pop, shall be	70 lbs. per bu.
Corn meal, unbolted, shall be	48 lbs. per bu.
Corn meal, bolted, shall be	50 lbs. per bu.
Cucumbers shall be	48 lbs. per bu.
Chestnuts shall be	50 lbs. per bu.
Cement shall be	80 lbs. per bu.
Coke shall be	40 lbs. per bu.
Charcoal shall be	22 lbs. per bu.
Coal, stone, shall be	80 lbs. per bu.
Canary seed shall be	60 lbs. per bu.
Clover seed, red and white, shall be	60 lbs. per bu.
Cotton seed shall be	28 lbs. per bu.
Flax seed shall be	56 lbs. per bu.
Flour shall be	196 lbs. per bbl.
Fish shall be	200 lbs. per bbl.
Gooseberries shall be	48 lbs. per bu.
Grapes, with stems, shall be	48 lbs. per bu.
Grapes, without stems, shall be	60 lbs. per bu.
Horseradish shall be	50 lbs. per bu.
Hickory nuts shall be	50 lbs. per bu.
Hair, plastering, shall be	8 lbs. per bu.
Hominy shall be	62 lbs. per bu.
Hungarian seed shall be	48 lbs. per bu.
Hemp seed shall be	44 lbs. per bu.
Land plaster shall be	100 lbs. per bu.
Lime, unslaked, shall be	80 lbs. per bu.
Lime, slaked, shall be	40 lbs. per bu.
Liquids shall be	42 gals. per bbl.
Melon, cantaloupe, shall be	50 lbs. per bu.
Melon, cantaloupe, shall be	2½ bu. per bbl.
Millet, German, seed shall be	50 lbs. per bu.
Millet, Missouri, shall be	50 lbs. per bu.
Millet, Tennessee, shall be	50 lbs. per bu.
Orchard grass seed shall be	14 lbs. per bu.
Osage orange seed shall be	33 lbs. per bu.
Oats, seed, shall be	32 lbs. per bu.
Onions, matured, shall be	56 lbs. per bu.
Onions, top buttons, shall be	28 lbs. per bu.
Onions, button sets, shall be	32 lbs. per bu.
Parsnips shall be	50 lbs. per bu.
Peas, dry, shall be	60 lbs. per bu.
Peas, green, in hull, shall be	30 lbs. per bu.
Peas, green, in hull, shall be	2½ bu. per bbl.
Peaches, matured, shall be	50 lbs. per bu.
Peaches, dried, shall be	25 lbs. per bu.
Pears, matured, shall be	56 lbs. per bu.
Pears, dried, shall be	26 lbs. per bu.
Plums shall be	64 lbs. per bu.
Pie plant shall be	50 lbs. per bu.
Potatoes, Irish, shall be	2½ bu. per bbl.
Potatoes, Irish, shall be	60 lbs. per bu.
Potatoes, sweet, shall be	50 lbs. per bu.
Potatoes, sweet, shall be	2½ bu. per bbl.
Peanuts shall be	23 lbs. per bu.
Pork, net, shall be	200 lbs. per bbl.
Quinces, matured, shall be	48 lbs. per bu.
Raspberries shall be	48 lbs. per bu.
Rye seed shall be	56 lbs. per bu.
Redtop shall be	14 lbs. per bu.
Rye grass, Italian, seed shall be	20 lbs. per bu.
Sage shall be	4 lbs. per bu.
Salt shall be	50 lbs. per bu.
Sorghum molasses shall be	12 lbs. per gal.

Legal Weights and Measures State of Tennessee.—Continued.

Sorghum seed shall be	50 lbs. per bu.
Strawberries shall be	48 lbs. per bu.
Salads, turnips, kale, shall be	30 lbs. per bu.
Salads, mustard, spinach, shall be	30 lbs. per bu.
Turnips shall be	2½ bu. per bbl.
Turnips shall be	50 lbs. per bu.
Tomatoes shall be	56 lbs. per bu.
Timothy seed shall be	45 lbs. per bu.
Velvet grass seed shall be	7 lbs. per bu.
Walnuts shall be	50 lbs. per bu.
Wheat shall be	60 lbs. per bu.

PRICES OF FARM PRODUCTS.

The average price to producers of the United States of important products on dates indicated were:

Product	Oct. 1, 1914.
Corn, bu.	\$.782
Wheat, bu. ....	.935
Oats, bu. ....	.433
Barley, bu. ....	.518
Rye, bu. ....	.790
Buckwheat, bu. ....	.787
Flax, bu.	1.27
Hay, ton	11.77
Potatoes, bu. ....	.647
Sweet potatoes, bu. ....	.873
Cotton, lb. ....	.078
Butter, lb. ....	.260
Chickens, lb. ....	.125
Eggs, doz. ....	.235

Product.	Sept. 15, 1914.
Hogs, 100 lbs.	8.11
Beef cattle, 100 lbs.	6.38
Veal calves, 100 lbs.	8.06
Sheep, 100 lbs.	4.80
Lambs, 100 lbs.	6.27
Milch cows, each	59.58
Horses, each	132.00
Wool, unwashed, lb. ....	.186
Honey, comb., lb. ....	.137
Beans, bu.	2.46
Clover seed, bu.	9.10
Timothy seed, bu.	2.46
Alfalfa seed, bu.	7.21
Cotton seed, ton	13.88
Broom corn, ton	77.05
Cabbage, 100 lbs.	1.50
Onions, bu.	1.03
Tomatoes, bu. ....	.63
Apples, bu. ....	.62
Peaches, bu.	1.37

The index number of prices of all important crops to producers October 1, was 1.9 per cent lower than a year ago, 6.1 per cent above two years ago, and 3.2 per cent above the average on October 1 of the past six years.

The average price of meat animals on September 15 was \$7.58 per one hundred pounds, compared with \$7.15 a year ago, \$6.74 two years ago, \$5.87 three years ago, and \$6.92 four years ago on September 15.

OCTOBER CROP REPORT, TENNESSEE AND UNITED STATES.

Bureau of Crop Estimates, in cooperation with Weather Bureau, United States Department of Agriculture.

Estimates as of October 1, 1914, with comparisons, made by the Bureau of Crop Estimates (formerly Bureau of Statistics), are given below:

Crop.	Tennessee.	United States.
Wheat, preliminary estimate, 1914, bu.	10,635,000	892,000,000
Corn, October 1 forecast, 1914, bu.	81,000,000	2,680,000,000
Oats, preliminary estimate, 1914, bu.	6,760,000	1,140,000,000
Potatoes, October 1 forecast, 1914, bu.	1,820,000	382,000,000
Sweet potatoes, October 1 forecast, 1914, bu.	1,720,000	55,000,000
Tobacco, October 1 forecast, 1914, lbs.	59,100,000	954,000,000
Hay, preliminary estimate, 1914, tons	907,000	68,604,000
Apples, October 1 forecast, 1914, bu.	7,540,000	230,000,000

COTTON GINNED IN TENNESSEE PRIOR TO SEPTEMBER 25, CROP OF 1914.

Following is the Federal Government report of cotton ginned by counties in Tennessee for the crop of 1914. Quantities are in running bales, counting round as half bales. Linters are not included.

County.	Bales.
Carroll	21
Chester	227
Crockett	462
Dyer	433
Fayette	1,243
Gibson	556
Giles	455
Hardeman	652
Hardin	483
Haywood	621
Henderson	109
Lake	2,428
Lauderdale	938
Lawrence	52
Lincoln	955
McNairy	716
Madison	616
Obion	206
Rutherford	321
Shelby	3,325
Tipton	1,010
Weakley	237
All other	9

Total..... 16 075

The number of bales ginned to the same time last year was 18,359.

The trouble with windows set high up is that they let the sun shine on the perches when the hens are on the floor scratching, and when they are on the roost the sun doesn't shine, so there is no equilibrium in such plans.

THE COMING OF CHEAP LIME.

Largely as a result of the protests against high prices at the point of shipment and high freight rates, we are gratified to note that at last there have come concessions on the part of manufacturers and transportation companies that will insure, in many sections of *Progressive Farmer* territory, lime delivered to the farmer at prices he can afford to pay.

One of the leading railroad systems in the South, a system, by the way, which is really helping to better agricultural conditions along its lines, led off by making an unusually low rate on agricultural lime. At the same time the manufacturers, seeing their opportunity, increased the capacity of their plants and thus placed themselves in a position to lower prices. In the meantime, the widespread agitation for the use of more lime, provided always that prices are right, has served largely to increase the demand, so that the manufacturers, the common carriers, and the farmers are all to benefit from this spirit of concession and cooperation.

In Alabama, and possibly other States of the South, crushed limestone is now being put on the cars at seventy-five cents a ton, and the railway system above referred to is hauling it at a rate that will enable many farmers to lay it down at their stations for less than two dollars a ton. The *Progressive Farmer* has never advocated the use of lime at high prices; but at two dollars or less the South should unquestionably be able to use profitably millions of tons. If in certain sections high freight rates and high manufacturers' prices still prevail, we would suggest that our readers take up with the railroad companies, their local boards of trade, and the manufacturers the matter of cheaper lime, and the benefits from its coming that will accrue to all concerned. The *Progressive Farmer* would be glad to hear from the farmers, the railroads, and the limestone crushers on this subject.—*The Progressive Farmer*.

PLOWING UNDER COWPEAS FOR GREEN MANURE.

A reader says: "I sowed 25 acres of peas after oats, intending to plow them under to enrich the land, but since my corn crop has been cut short by the drouth I feel that I cannot afford to plow under these peas and buy feed for my stock. What do you think?"

As a general rule a man cannot afford to plow under a feed crop for manure and buy feed. It is probably true that the pea crop plowed under would do more good to the land than the stable manure made from feeding the peavine hay; for the animals will take out some

of the plant foods from the pea vines and some of them will be lost from the manure under ordinary farm management before it is returned to the land. The humus-forming material in the crop will also be greatly reduced by passing it through the animals, so taking the whole proposition it is quite certain the land will not receive as much if the crop is fed off the land and the manure returned as it would if it were plowed under. The land might be so greatly in need of humus that it would pay to plow under one crop of peas and buy feed, but this is probably not generally true.

On the other hand, protein and nitrogen which make the pea vines valuable are also abundant and cheap in cottonseed meal, considering its feeding and manurial value. If, therefore, purchased cottonseed meal would take the place of these pea vines for feeding and the land is greatly in need of humus it might pay well to plow under these peas and buy cottonseed meal. For cottonseed meal is sold on its fertilizer value and is worth its present price either as a feed or as a fertilizer. Ordinarily and as a general rule or principle it will not pay to plow under good feed for its fertilizer value only, but under special conditions and on land which must have the additional humus to produce a profitable crop it might pay to turn it under if a cheap material like cottonseed meal will serve as a substitute feed for the stock.—*The Progressive Farmer*.

HOME CLASS IN PRACTICAL FARMING AND DOMESTIC SCIENCE FOR GROUPS OF FARM WORKERS.

A plan whereby ten or more farmers or farm women can form home classes in agriculture or domestic science and receive the text-books, lectures, lantern slides, laboratory and cooking equipment necessary to conduct them has been devised by the U. S. Department of Agriculture in cooperation with agricultural colleges of certain States.

The object of the plan is to make accessible at home, to men and women who have not the time or means to attend the regular courses at the colleges, practical short courses in agriculture and home management specially adapted to their districts. These courses, which will consist of fifteen to twenty lectures, and will consume five or more weeks, can be arranged to suit the spare time and convenience of each group of people.

The courses to be offered at first are poultry raising, fruit growing, soils, cheese manufacturing, dairying, butter making, and farm book-keeping; and for the women especially, courses in the preparation,

cooking and use of vegetable and cereal foods. The department will supply lectures and lantern slides covering these subjects, and the States which have agreed to cooperate in the plan will lend to each group laboratory and cooking apparatus valued at \$100 and a reference library. The text-books and lectures will be made so complete that each group can safely appoint one of its members as study leader to direct the work of the course.

When a group has decided to take up the work, the State which cooperates sends an agent with the department's representative to organize a sample class and assist the leader whom they elect in laying out the work and in showing him the best methods of procedure. The classes commonly are held from 8 to 12 o'clock in the morning and from 1 to 4 o'clock in the afternoon, two or three days each week. The sessions are not held every day, so that the members will have time to attend to their farm duties in between the sessions, as well as before and after the instruction period. The classes meet commonly at the most convenient farmhouse. During the morning hours text-book work is done. In the afternoon laboratory work is conducted, and the women who have elected to take the domestic science course have practical lessons in cooking.

As soon as a class is established, the State organizer withdraws to start a class in some other district. The work thereafter is left in charge of the leader, who receives assistance by mail from the college or the department in carrying on the work.

As there is no regularly paid instructor, classes can be carried on all over the State as rapidly as the college organizer can visit the groups, and as quickly as the laboratory sets supplied by the college become available. The local leader will preside during the reading of the lectures and references, for which full texts and lantern slides are supplied by the department. He will also be responsible for the laboratory equipment. Every one who completes the course will receive a certificate from the State College.

Not all of the States have yet agreed to cooperate in this plan. Last winter experiments along these lines were carried out successfully in Pennsylvania, and this has stimulated an interest in the method in other States. In one of the Pennsylvania classes more men applied than could be accommodated, and all of the twenty men and fifteen women who began the course completed it. Pennsylvania is now arranging for more classes, while Massachusetts, Michigan, Vermont and Florida expect to take up the work. Other States, such as Maine, New York, New Jersey and Delaware have signified their willingness to cooperate.

Ordinarily a college in a State usually applies to the department seeking its cooperation, when sufficient interest has been shown in the plan in several communities where ten or more people have sought the instruction. For financial reasons certain colleges are not so able to engage in the work as are others.

The advantage claimed for the new home courses with local leaders and laboratory equipment over the ordinary correspondence courses is that only a small percentage of those who take the individual correspondence course finish it. Studying in a group, with laboratory work and a leader, seems to stimulate the interest and add a social feature which lead the members of the group to follow the work conscientiously and complete it. Experiments with free correspondence courses show that while many individuals gain advantage from them, many others, because the material is furnished free, do not feel the same obligation to complete them as they do when they pay a substantial sum of money for the instruction.

A PINCH OF SALT FOR THE TROUBLESOME DANDELION.

DEPARTMENT OF AGRICULTURE GIVES PRACTICAL METHODS FOR KILLING DANDELIONS AND PLANTAINS THAT RUIN THE APPEARANCE OF LAWNS.

The best way to kill individual dandelion plants is to cut off their tops and put a pinch of salt (about a thimbleful) on the surface of each exposed root. This will kill most of them. As salt if generally applied ruins soil, the salt should be used sparingly and applied only to the top roots of the dandelions. The U. S. Department of Agriculture has for some time been testing various poisons to discover the most efficient means of eradicating this troublesome weed from lawns, but although others have been found satisfactory, the common salt is best for general use, as there is no danger accompanying its application.

The department's specialists say that much effort is wasted in merely cutting off the dandelion top without applying some poison to the root that remains. The dandelion has a tap root that grows deep into the soil, and cutting off the plant merely encourages the dandelion to come up in a thicker growth.

The time to eradicate dandelions is in the spring before the plant has had time to form seed. The seed spreads rapidly, blown by the wind. The blossoms should be close mown before they have gone to seed, and salt should then be applied to each root. A man may be

very diligent in caring for his own lawn and yet have seeds blown in from neighboring lawns. This is of such importance to those desiring fine lawns that it might be made a matter for community action.

If the lawn is very full of this weed it is too tedious a process to treat each plant by the salt process. In this case two possible methods of eradication may be recommended. The first method is to thicken the stand of grass to tend to crowd out the dandelion. The grass should be put into a vigorous condition by top dressing with well-rotted manure or fertilizer in the fall, and by reseeding in thin places. The second method, advised in extreme instances, is to start all over again. Plow up the lawn first (or spade it up if the area is small). A generous amount of well-rotted manure should then be worked into the soil, but not fresh manure, for that is full of weed seeds ready to germinate. In case manure is not available, commercial fertilizers may be used. Many lawn soils are in need of lime and it is often a wise plan to use it, especially if white clover is to be sown. After plowing, the land should be harrowed or raked frequently to reduce it to a good seed bed condition. This will encourage the early germination of weed seeds with the subsequent extermination of the seedlings. Thorough cultivation at this period will destroy the dandelion plants, both those that come from roots and seeds. After following either of the two plans sketched here, the lawn should be maintained in good condition by careful mowing, rolling and watering.

Spraying with iron sulphate solution to kill dandelions without killing the grass is not recommended by the department, although it has been tried by some who consider it successful. Experiments do not seem to establish it as a practical method.

The dandelion is not a native American plant, having been introduced from Europe several centuries ago. It was first introduced in the East and has spread westward with our emigration. The weed is common all over Europe, and has gone into other lands with settlers from the older country, always being found near the communities of man.

The name "dandelion" is said to come from the French, "Dent de Lion," which means tooth of lion, and refers to the tooth-shaped edges of the leaf of the plant.

The dandelion is widely used throughout Europe as a truck crop. Certain foreigners recently arrived in America have continued to use the plant as a vegetable, and Italians in the neighborhood of large cities have made considerable profit by gathering and taking it to market.

Several places around Boston now grow the dandelion as a truck crop. The seeds are sown in July or August in rows 12 inches apart,

and although the plants are of good size in the fall, they are not generally gathered for the market until early in the spring. As soon as the snow is off the ground the crops are gathered, and for a time the farmers receive from \$1 to \$1.25 a bushel for these greens. By May the price has fallen to about 50 cents a bushel, and then the ground is plowed up to make room for other vegetables, as the dandelion is no longer profitable.*

Another weed that injures the beauty of many lawns is the plantain, of which there are two varieties; the buckhorn, or rib grass, and the common, or broad leaf.

The same methods that apply to eradicating the dandelion apply to the plantain except the method of poisoning the individual plant. Instead of cutting off the top and sprinkling the root with salt, as is done in the case of the dandelion, the individual plantain may best be removed by pulling up by the root after a heavy rain when the ground is wet. The plantain does not offer a difficult problem, as the roots are pulled up readily, even from clay soil, after a heavy rain.

EVERYBODY CAN CANDLE EGGS.

UNCLE SAM'S COLORED CHART WILL HELP YOU TELL HOW FRESH
THEY ARE.

To enable farmers and housewives to test eggs before a candle and tell accurately their condition before they are opened, the U. S. Department of Agriculture has just published a colored egg-candling chart. To give a true picture of the eggs, twelve impressions were necessary to produce this lithographed chart.

This chart shows the eggs in their natural size as they appear before a candle, and also as they look when open in a glass saucer. The pictures include an absolutely fresh egg, slightly stale eggs, decidedly stale eggs, eggs with yolks sticking to the shell, eggs where the chicken has developed so far that blood has been formed, moldy eggs, addled eggs, and eggs with a green white.

Comparatively few housewives are aware that a green color in the white of eggs is due to the presence of billions and billions of a certain species of bacteria that make a green coloring matter. Eggs with this greenish tint, even though the yolks seem to be perfect, are not fit for food.

As long as the department's supply lasts, these charts will be furnished free upon application to the Editor and Chief, Division of Publications. Commercial shippers of eggs, however, should apply for Departmental Bulletin 51, a technical paper on testing by scientific

methods not available to the average farmer. This bulletin includes the colored illustrations. This chart alone will be found to be not merely of great service to the housewife wishing to test the eggs she is to serve to her own family, but also of commercial value to farmers, country merchants, or egg shippers who wish to buy and handle eggs on an accurate quality basis.

The great spoilage of eggs in this country is due to bad handling and is quite unnecessary. Part of the remedy is to teach everybody from the farmer to the consumer how to tell the quality of an egg without breaking the shell. The country buyers, the middlemen and the housewife judge of the quality of the inside of a cucumber or an eggplant, or any other vegetable, by the appearance of the outside and the firmness of its texture. It is not possible to tell the quality of an egg by looking at the shell, though it is safe to say that the eggs with shiny shells are apt to be aged. A fresh egg looks as though it had been dusted with a very fine powder; the "bloom," as the egg men say. But in order to know what is inside the shell the egg must be held in front of a strong light—such as an electric bulb furnishes—which comes through a hole about $1\frac{1}{4}$ inches in diameter. The room must be dark. When the egg is held close against the hole the bright light renders its contents visible, and the quality is indicated by the appearance of the yolk, the white and the air space at the blunt end. There are many egg "candles" on the market, but the housewife can easily make one for herself by cutting a hole in a small pasteboard box, which is slipped over an electric light bulb. If gas or an oil lamp is the source of light, a tin box or can should be used.

MILK CANS SHOULD BE JACKETED.

The Dairy Division of the Department of Agriculture has just completed a series of tests on the change in temperature of milk in cans during transportation from the farm to the consumer. These tests established the importance of jacketing cans of milk with some appropriate insulating material.

It has been found that milk that has to be sent only short distances or preserved for only a few hours should maintain a temperature of less than 50 degrees. Even at these temperatures some bacteria will multiply and cause the souring of the milk, but the increase is slow and during a few hours no serious results will occur. A temperature well below 50 degrees F., however, materially decreases the rate of bacterial growth.

On the other hand, where milk is to be shipped long distances, the

initial temperature must be lower, assuming that no provision is made for maintaining the original temperature during transportation. Where milk is in transit for several hours it is necessary to cool it down to near the freezing point. So soon as the milk can, however, is exposed to air temperature, and especially to the sun, the temperature of the milk begins to rise very rapidly and every precaution should be taken to keep it from being raised by the outside heat.

A series of experiments was recently made in shipping milk cooled to 50 degrees. In these cases the cans were set in an open truck, with no covering to shield them from the direct rays of the sun. The milk was hauled a distance of thirteen miles and the average air temperature during the trip was 82.65 degrees. The experiment showed that the cans that were hair-quilt jacketed showed a rise of only $5\frac{1}{2}$ degrees in three hours in the temperature of the milk. The cans that were wrapped with wet burlap showed a milk temperature of $58\frac{1}{2}$ degrees in the same period, or a rise of $8\frac{1}{2}$ degrees. The milk in the unjacketed cans rose in three hours to $78\frac{1}{2}$ degrees, or a rise of $28\frac{1}{2}$ degrees.

It is obvious from these figures that it pays to jacket the cans in order to maintain a low temperature during transportation.

MUCH COMFORT FOR POULTRY.

In our winter poultry house on cold, snowy days our hens sing and cackle as if they were enjoying summer weather. The house is 14x56 feet, with large windows on the southern exposure. Its equipment consists of clean, inviting nest boxes, self-feeders, with grit and shells, the ground floor banked deeply with leaves and straw, writes George W. Brown, of Hancock County, Ohio, in the New England Homestead. We keep the hens busy from daylight until perch time digging after small grain scattered several times daily in the litter. Lawn clippings, meat offal, beets, pumpkins, cabbage and an occasional sheaf of wheat, oats or clover hay suspended from the roof gives them business.

It is the busy hen that lays the eggs. She hustles and has red blood coursing in her veins to keep her warm on cold days. Our perches can be hooked to the roof, and if we have any drones in the flock inclined to spend much of the day on the perch we just hook the perches to the ceiling. They soon get the habit of hustling with the rest of the flock. We have no use for drones on our farm save in our apiary.

CROP REPORT FOR SEPTEMBER.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., October 1, 1914.**

Crop reporters in only seventy-five counties made reports for the crop month ending September 20. Reports are more favorable for production in general than previous months indicated, general conditions being much improved by late rains. The averages are also above those shown for the same period last year, indicating increased yields in the principal crops.

Cotton crop has been delayed somewhat by rainy weather, and there has been some damage by army worms, but indications are for an average crop. Up to September 25 there had been ginned in the State 16,075 bales, as against 18,359 at the same period last year.

The weather has been favorable for peanuts, potatoes and forage crops. There will be an increase in the yield of sweet potatoes, and the yield of peanuts will probably be about an average.

The condition of millet shows an improvement, as does also that of clover and stock peas.

The yield of corn in the State will be much better than reports of previous months indicated. Late rains helped late corn, and the prospects are for a yield of between two-thirds and four-fifths of an average crop.

The condition of live stock in the State is good. The farmers are taking up the serum treatment of hogs for cholera, and this will materially decrease the loss from that scourge in the near future.

Following is the summary for comparison of the reports of this department for the month of September, 1913 and 1914:

	Per cent. 1913	Per cent. 1914
Cotton, condition	67	70
Millet, condition	64	79
Corn, condition	61	76
Tobacco, condition	68	77
Stock peas, condition	64	74
Sweet potatoes, condition	65	80
Sorghum, condition	71	84
Tomatoes, condition	66	82
Peanuts, condition	78	76
Clover, condition	56	68
Live stock, condition	87	87
Alfalfa, condition	76	81

D

Central Section of
Middle Tennessee.

Sumner	90	60	75	70	85	80	75	70	65	90	90
Trousdale	100	95	100	100	100	100	100	100	20	80	...
Davidson	80	80	...	75	80	100	85	...	65	85	...
Wilson	...	...	...	...	...	...	...	...	...	...	...
Williamson	...	...	...	...	...	...	...	...	...	...	...
Rutherford	...	...	...	...	...	...	...	...	...	...	...
Cannon	100	80	55	...	75	90	65	...	45	90	80
Maury	...	85	80	75	80	80	75	80	40	90	...
Marshall	80	90	70	95	90	85	90	70	70	80	...
Bedford	90	85	85	90	95	90	90	85	75	90	80
Giles	...	50	50	40	...	70	...	...	60	85	80
Lincoln	...	70	70	85	60	80	...	...	50	95	...
Moore	...	70	70	...	...	...	...	...	...	...	...
Macon	...	70	100	50	80	85	...	...	...	...	...
Clay	...	70	95	80	70	90	85	...	70	...	...
Pickett	...	90	95	80	95	95	85	...	70	85	...
Overton	...	85	85	65	85	90	75	...	75	85	...
Jackson	...	80	75	100	100	100	100	80	100	100	...
Smith	...	75	90	70	...	85	75	60	60	90	75
Dutham	...	...	...	...	...	...	...	...	...	...	...
DeKalb	...	90	90	75	65	90	70	80	50	90	...
White	...	85	95	85	85	95	80	100	85	95	90
Warren	...	75	70	90	80	90	90	80	60	95	80
Coffee	...	...	...	...	...	...	...	...	...	...	...
Grundy	...	...	90	...	95	...	100	...	80	100	...
Franklin	...	...	...	...	...	...	...	...	...	...	...
Scott	...	80	95	90	90	80	...	75	80	80	...
Fentress	...	...	...	...	...	...	...	...	...	...	...
Morgan	...	90	100	90	95	85	100	90	70	35	...
Cumberland	...	95	95	85	85	90	95	85	75	95	70
Van Buren	...	80	90	85	80	85	100	100	100	80	...
Campbell	...	90	90	85	80	80	90	100	...	85	100
Bledsoe	...	...	...	...	...	...	...	...	...	...	...
Sequatchie	...	65	75	...	75	80	90	...	70	90	...
Marion	...	...	...	...	...	...	...	...	...	...	...

E

Eastern Section of
Middle Tennessee.

F

Cumberland Plateau.

SEPTEMBER CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT	COUNTY.	Cotton—condition.	Millet—condition.	Corn—condition.	Tobacco—condition.	Stock Peas— condition.	Sweet Potatoes— condition.	Sorghum—condition.	Tomatoes—condition.	Peanuts—condition.	Clover—condition.	Live Stock— condition.	Alfalfa—condition.
G Central Section of East Tennessee.	Claiborne	75	90	75	60	75	80	90	90	75	85	95	80
	Hancock	80	80	70	70	50	50	75	80	75	60	80	80
	Anderson	85	80	70	70	60	60	80	90	75	65	95	70
	Grainger	85	80	70	70	60	60	80	90	75	65	95	70
	Union	85	80	70	70	60	60	80	90	75	65	95	70
	Knox	85	80	70	70	60	60	80	90	75	65	95	70
	Rhea	85	80	70	70	60	60	80	90	75	65	95	70
	Roane	85	80	70	70	60	60	80	90	75	65	95	70
	Loudon	85	80	70	70	60	60	80	90	75	65	95	70
	McMinn	85	80	70	70	60	60	80	90	75	65	95	70
	Meigs	85	80	70	70	60	60	80	90	75	65	95	70
	Bradley	85	80	70	70	60	60	80	90	75	65	95	70
	Hamilton	85	80	70	70	60	60	80	90	75	65	95	70
	James	85	80	70	70	60	60	80	90	75	65	95	70
H Mountain Section of East Tennessee.	Johnson	75	90	75	60	75	80	90	90	75	85	90	80
	Sullivan	80	80	70	70	60	60	80	90	75	65	95	70
	Carters	80	80	70	70	60	60	80	90	75	65	95	70
	Hawkins	80	80	70	70	60	60	80	90	75	65	95	70
	Washington	80	80	70	70	60	60	80	90	75	65	95	70
	Unicoi	80	80	70	70	60	60	80	90	75	65	95	70
	Greene	80	80	70	70	60	60	80	90	75	65	95	70
	Hamblen	80	80	70	70	60	60	80	90	75	65	95	70
	Jefferson	80	80	70	70	60	60	80	90	75	65	95	70
	Cocke	80	80	70	70	60	60	80	90	75	65	95	70
	Sevier	80	80	70	70	60	60	80	90	75	65	95	70
	Blount	80	80	70	70	60	60	80	90	75	65	95	70
	Monroe	80	80	70	70	60	60	80	90	75	65	95	70
	Polk	80	80	70	70	60	60	80	90	75	65	95	70

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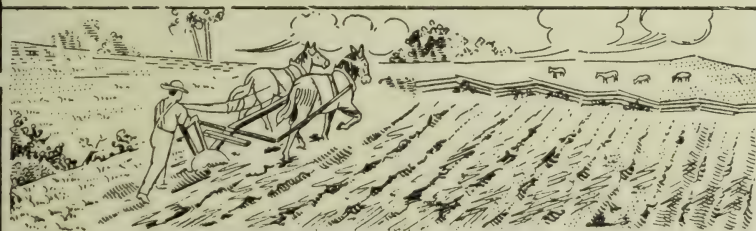
IN THIS ISSUE

Proceedings of

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and Home-Makers' Association

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October 6-8, 1914



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Department of Agriculture.

STATE OF TENNESSEE.

THOS. F. PECK, Commissioner.
T. G. SETTLE, Chief Clerk.
A. L. GARRISON, Chief Feed, Seed and Fertilizer Inspector.
DR. GEORGE R. WHITE, State Veterinarian.
J. W. SAMPLE, State Chemist.
J. A. DINWIDDIE, Assistant Commissioner for East Tennessee.
JESSE TOMLINSON, Assistant Commissioner for Middle Tennessee.
R. T. DEBERRY, Assistant Commissioner for West Tennessee.
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NOBLE C. WHITE, Feed, Seed and Fertilizer Inspector for Middle Tennessee.
A. M. STOUT, Feed, Seed and Fertilizer Inspector for West Tennessee.
G. M. BENTLEY, State Entomologist and Plant Pathologist.
DR. J. S. WARD, State Inspector of Apiaries.
HOYT N. HARDEMAN, Stenographer.

Bureau of Immigration.

STATE OF TENNESSEE.

THOS. F. PECK, Commissioner.
T. G. SETTLE, Secretary.
J. A. DINWIDDIE, Assistant Commissioner for East Tennessee.
JESSE TOMLINSON, Assistant Commissioner for Middle Tennessee.
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MIDDLE TENNESSEE FARMERS' INSTITUTE**NASHVILLE, TENNESSEE**

THIRTEENTH ANNUAL SESSION

FIRST DAY—TUESDAY, OCTOBER 6, 1914.

MORNING SESSION.

The thirteenth annual convention of the Middle Tennessee Farmers' Institute was held at the Fair Grounds at Nashville on Tuesday, Wednesday and Thursday, October 6, 7 and 8, 1914. Several hundred delegates were present when the first session was called to order at 9.30 o'clock on Tuesday morning, by President Robert Gallagher, of Bedford County.

The invocation was offered by Rev. Allen Fort, pastor of the First Baptist Church, of Nashville. In the absence from the city of Gov. B. W. Hooper, the welcome address was delivered by Robert S. Henry, his private secretary. Mr. Henry's address follows:

WELCOME ADDRESS.

GENTLEMEN: I am sorry that Governor Hooper is not here himself to welcome you, for two reasons: He knows more about farming than I do, and he also knows more about welcoming.

If the Governor were here, though, no welcome that he could give in words would express his real interest in Tennessee farming and Tennessee farmers one-half so well as his act in the appointment of Capt. T. F. Peck as Commissioner of Agriculture. Deeds speak louder than words, and the Governor has already spoken through his deeds.

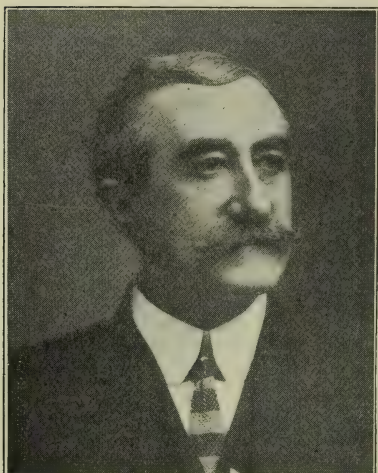
I wish, however, merely to add a word to attempt to impress upon you the fact that no body of men ever gathers in Nashville who are more welcome than the farmers of Middle Tennessee. I trust that your sessions will be filled with pleasure and profit.

Mr. John Henry, of Sumner County, responded to the address of welcome.

ADDRESS OF PRESIDENT ROBERT GALLAGHER.

The annual address of the President was as follows:

ADDRESS OF PRESIDENT ROBERT GALLAGHER.



We are here today as the representatives of one of the fairest portions of one of the best states in the Union, and may I be permitted to say that it is with pleasure that we have received this generous welcome to the hospitality of this fair city.

We are here in hostile array to no lawful pursuit or profession, but recognizing that all other callings in life are dependent on the farmer and that abiding general prosperity can only be maintained by the existence of conditions favorable to the prosperity of the farmer, we would confer together, actuated only by the hope that we may be enabled to better our conditions and thereby the condition of all others.

The agricultural interests of the country constitute the basis of the entire superstructure of all civil development; then, in order that this superstructure may become the most symmetrical and well poised of which the most polished civilization is susceptible, let us guard well this great interest.

Let us hope that this system of farmers' institutes, so ably conducted by our Commissioner of Agriculture, may result in inspiring all tillers of the soil with a zeal commensurate with the possibilities of the calling in which they are engaged.

It is encouraging and an omen potential of good to the agricultural interests of our State when those eminent in other pursuits of life unite with us in these meetings, as they are doing today, and labor together with us in upbuilding and strengthening the agricultural interests of our common country.

Then let us hope that each member present will contribute his part toward making this the most successful and interesting meeting yet held by this body.

REPORT OF SECRETARY T. G. SETTLE.

T. G. Settle, Secretary of the Institute, read his annual report, which was as follows:

To the President and Members of the Middle Tennessee Farmers' Institute:

Four thousand copies of the proceedings of the 1913 meeting of the Middle Tennessee Farmers' Institute were printed and distributed to those in attendance at that meeting. Some of the surplus copies are on the platform,



as well as other literature, and delegates are requested to take copies.

At the 1913 meeting of the institute there was shown to be on hand:

Balance from 1912 meeting...\$1,257 43

At the 1913 meeting there was collected 1,086 00

Making a total of.....\$2,443 43

Set aside for Home-Makers...\$ 142 00

Cost of printing proceedings and other expenses..... 1,177 03

\$1,319 03

Leaving a balance of..... 1,124 40

Respectfully submitted,

T. G. SETTLE, *Secretary.*

NO ASSESSMENT COLLECTED THIS YEAR.

Following the reading of the report the convention, by vote, decided not to assess the delegates the one dollar fee for the validation of certificates for return.

ADDRESS OF COMMISSIONER T. F. PECK.

The next number on the program was the address of T. F. Peck, Commissioner of Agriculture. Captain Peck's address follows:

RURAL COMMUNITY COOPERATION.

By T. F. PECK,

Mr. Chairman, Ladies and Gentlemen:

This is an opportune time for the farmers of Middle Tennessee to get together and discuss trade conditions now confronting the farmer because of the European war.

Just a few months ago the cotton farmers of the South were very optimistic. They had prospects for a maximum crop of cotton with fair prices. But, with no warning, war spread over all Europe, paralyzing our trade with those countries; and we realize that we have more than four million bales of cotton in excess of probable market demands. And we have the cotton speculator, wideawake and ready to heap up his wealth at the expense of the helpless producer.

I was in Washington Monday and Tuesday of last week as Governor Hooper's representative at a conference of the Governors, Senators and congressmen from the Southern States, who met to consider the situation and if possible find a way to relieve it. All agreed that two things must be done to provide relief. First, that the farmers must have assistance in carrying over the surplus cotton for twelve months; second, that the acreage must be reduced to keep within bounds of consumption of cotton.

The matter of providing relief was to be undertaken by the Southern representatives in Congress by working to secure a loan to the farmer for one-half of his crop for one year, at a rate of 3 per cent interest, to secure the passage of the warehouse bill, and to secure deposits for State banks in the Southern States and relieve them from the 10 per cent tax.

The matter of securing the reduction of acreage was delegated to the Governors. Many plans were suggested, calling for legislative enactment of

laws to control the acreage to be planted, but the majority agreed that the more practical way was to enlist the cooperation of the farmers themselves, believing that they were intelligent enough to realize that, with the Government loan to carry over their surplus at a low rate of interest, by reducing the acreage they would ultimately get as much out of the surplus carried over as they would by growing another crop, overproducing and demoralizing prices. Then, too, they would be enabled to grow other crops, for which there is bound to be a great demand at good prices, to feed the people of Europe while they are demoralized with the present war and its after effects.

If our farmers can be induced to think and act along the lines suggested they can readjust their business without serious present loss or inconvenience and

ultimately place themselves on a more substantial footing.

We have here today many farmers from the cotton sections of Middle Tennessee. I hope you will not go away from this meeting without taking some practical steps that will be effective in reducing the acreage in Tennessee. The argument made at Washington in favor of compulsory steps being taken was that, if it was not made compulsory, with rigid penalties for violations, each farmer would expect the others to reduce acreage and he would plant more so as to profit by good prices; that all would violate a gentlemen's agreement and the result would be no decrease in acreage, with consequent low prices. The same argument was offered as an objection to a Governmental loan, taking cotton as security—that the farmer, by not keeping faith, would depreciate the value of the security. Now, my friends, I hope you will take action that will stick; that



you will produce other crops on your lands that will pay you better; that twelve months hence you will be marketing crops that cotton prices will not affect.

The present condition of affairs emphasizes to us the importance of cooperation among farmers. Without cooperation it will be hard to secure concert of action in solving the problem of reducing the cotton acreage, and without concert of action and cooperation on the part of farmers, the efforts of those honestly trying to help them will result largely in failure.

The State Department of Agriculture has been working for community cooperation for several months. We realize that if the farmers meet problems that are thrust upon them, just as the present one has been—without warning—without cooperation and concert of action, they are at the mercy of the speculator and must perforce submit to his manipulation of the markets to his personal advantage.

But if the present cotton complication had not arisen, there was and is great need for community cooperation among farmers in Tennessee. We have not been producing and supplying, in sufficient quantities, farm products consumed in the cities and towns of our own State. It has been shown that only 25 per cent of the farm products consumed in the cities and towns of Tennessee is produced within the State. Seventy-five cents on every dollar's worth of farm products goes out of the State, that would mean so much to every line of activity in the State if kept in active local circulation. We can correct this if we will, but not by every farmer working along independent lines, growing crops without regard for market demands. Our farmers in every community should get together and study soil conditions and market conditions, and produce crops or live stock to meet demands. Keep up quantity and quality, be in position to profit by the demand for food stuffs. Europe is not going to produce it to feed their people. If we do, we will find a great foreign as well as local demand.

In Tennessee we can produce as good as the best that can be produced anywhere. Some of our people are now doing it; more of us can if we will. To get the most out of it we must have community effort.

When we can get our people in the several communities to realize that the progress, development and prosperity of the local community in which they live mean more to them than the prosperity of all the other communities in the world, then it will be easy to establish community cooperation. Then our people will realize that they can hope to reap in a broader sense where they have sown. When we do what we can to make our own local community what it should be, we will have solved the problem of keeping the boys and girls on the farm, because we will have made the home community mean more to them than any other. They will be eager, when old age compels us to retire from the activities of life, to take up our work and carry it on to greater perfection.

The trouble with us in the past has been our pioneer inclinations to seek new fields rather than developing those we have. The day of the pioneer is past in this country. We must make up our minds to develop our splendid opportunities at home, instead of seeking new fields. When we develop the highest type of community cooperation, then we will be in position to profit in the broadest sense by our opportunities, than which none better can be found anywhere.

Our lack of cooperation has resulted in poor schools, poor roads and unsatisfactory social conditions, making home life on the farm so uninviting that our

boys and girls take advantage of the first opportunity to go where they believe they will find social conditions better and where they believe they can be more prosperous.

Are we going to drift along and let conditions continue as they are, when the remedy is within our reach? I do not think we should.

The hard problem will be to get down to the community idea of work. Our ideas are inclined to get too big on the start. We do not feel like we are accomplishing much if we fail to have large audiences, an elaborate program, and things go with a flourish.

But if we succeed in establishing community cooperation on a sound, practical basis, we have simply got to make up our minds to do community work. What I mean by community work is to select a community, locate its boundaries, get the names of every farmer in that community, find out who are the leaders and go to them, and outline the advantages to the community to be gained by working as a unit on all their problems.

Show them how it will affect them in the production and sale of live stock, of farm crops, of dairy products, fruits and vegetables. Get the leaders enthused with the benefits and advantages to be gained, get them to take the matter up with the other farmers in the community. When sufficient interest is aroused, arrange for a meeting of the farmers at the community school house or at the home of one of the farmers. At that meeting be prepared to show them the advantages socially, educationally and financially.

Show them how, as a community, they can be their own distributors, so that instead of only 40 cents* out of the dollar paid by the consumer for farm products going to the farmer, and 60 cents going to the distributor, they can graft on the production end of their business, distribution, and secure at least 50 per cent more for their farm products and save the consumer money.

We cannot work up an interest and perfect an organization and leave them to work alone, but keep in touch with them and help them get results. If we can get as much as two active community organizations perfected in each county in Tennessee in a year, we will have done the State a great service, because, with such a leaven, it will not take long to get cohesion and cooperation in every community in the State.

If we would improve agricultural conditions, let's begin with the first essential—practical and profitable community cooperation. Then the other forces can plant their seed of agricultural knowledge in ground that is fertile and that will produce results. We can solve the question if we will get down to individual work in the community in perfecting the organization, and stay with it until it is getting profitable results.

In this work we will have the cooperation of some of the railroads, and I believe all of them, when they understand the plan, and the good that will result from it, will cooperate in the work, because all of the railroads have manifested a keen, practical interest in agricultural development and have rendered the Department splendid cooperation in the work we have been doing. The railroads want increased tonnage and a prosperous citizenship along their lines. They will readily see that this work is the first essential step in that direction.

Now, as for the organization, make it simple and practical. A President, Vice-President and Secretary will be the officers necessary to start with. For

Secretary select a farmer who has had business training, for in addition to keeping the records of the meetings, he should keep posted as to market conditions.

The Tennessee State Fair is going to do its full share to encourage the movement. Next year there will be given a prize of \$800 for first, \$600 for second, \$400 for third, and \$200 for fourth prize, and four \$100 premiums in the order of merit for the best collective exhibit from county agricultural associations, and like prizes to same associations for best collective exhibits of live stock. This enables the communities to contribute to this collective exhibit, both of farm products and live stock. The winning counties will take the money back and offer it as premiums to the communities for the next year.

If the farmers of any community will perfect an organization and study the problems peculiar to that community, by cooperation they can solve the local problems. Instead of several types of beef cattle, they can agree on some particular breed or type, and all produce the same, reducing the cost for service animals, producing a uniform type and quantity sufficient to insure the best prices. The same will apply to all live stock.

Instead of every farmer trying to produce a crop different from his neighbor, and for which there is no market demand, and if there were, the quantity he would have would not attract buyers, it would be better for the farmers to determine the crops for which their soils are best suited and for which there is the greatest market demand, then all produce those crops, and when the crops are ready for market, prepare them attractively and build up a reputation for that community for the superior quality of its products.

Without community cooperation schools and roads grow worse instead of better, because every one in the community depends on some one else, and the schools and roads are neglected.

We complain about our boys and girls wanting to leave the farm. The fault is ours, not theirs. We have failed to make our community what it should be. We have neglected social and educational conditions. We have been indifferent about attractive home life conditions. We have only given our children an opportunity to see the drudgery side of farm life, and they are not to blame for wanting to get away from it.

We have communities in the State that are now cooperating and they are prospering, and there is no disposition there on the part of the young people to leave those communities.

We can and will have more prosperous and contented communities just as fast as they grasp the importance and value of community cooperation. If we want to be of real service to our community and the State, we have the opportunity in this work. We do not have to go away from home to start it, but begin in our own home community, remembering that "great oaks from little acorns grow."

We cannot afford to be indifferent to this matter. Your presence here is evidence that you are not, but the percentage of progressive farmers is entirely too small.

Just a few years ago resident Tennesseans owned the timber and mineral lands in this State. They owned the undeveloped water power. They did not appreciate their possibilities for development and producing wealth, or their possibilities for development by cooperation. But capitalists from other States

did, with the result that our own Tennesseans have sold their birthright for a mess of pottage. Those resources are being developed. We are furnishing them a market for their products. We are furnishing them their cheap day labor. Yet the profits are leaving Tennessee to enrich other sections of the country.

Some facts are not pleasant to contemplate, but we had better analyze conditions, understand them, and do what we can to improve them.

While a small percentage of our farmers are wideawake and proving that they have the capacity to profit by their opportunities, we all know that too many of them are clinging to obsolete methods of farming, every year reducing the fertility of their farms, and making it harder for them to provide the comforts and conveniences for those dependent upon them. We know they cannot continue indefinitely the hopeless struggle. Gradually they, too, will sell their birthright for a mess of pottage, and they will join the vast army of day laborers with little hope of ever becoming again independent producers.

The value of Tennessee soils and their ready response to intelligent treatment is known. Capital also knows that men trained in scientific agriculture can be secured, who can take the neglected land and the labor that will then have no choice, and rebuild those farms and make them produce bountiful crops and return good dividends for the invested capital.

The possibilities of our soils and advantages of climate and rainfall are too well known for the land to remain idle. It will be developed—but by whom? By our native Tennesseans, or by combinations of outside capital, where the profits will go to the money centers instead of remaining in active local circulation? It is far better for Tennessee and Tennesseans to retain the individual small farmer, to till his own ground, to harvest his own crop, and the profits from his labors remain in his own community, county and State, to make conditions better for all our people.

It does not matter whether we are farmers or engaged in some other vocation; if we are Tennesseans we are vitally interested in this question of improving rural life conditions, and we can all cooperate in getting more cohesion among the farmers. I think the first important step is individual work in encouraging community cooperation.

You are interested in your home community. It means most to you. Go back home when this Institute adjourns and get ready for community cooperation so that we can save to Tennesseans their birthright, which they will lose unless they adjust themselves to conditions confronting them, and which must be intelligently met.

In conclusion, my friends, while we are making progress towards better agriculture, better roads, and better schools; while we are providing better for our physical and mental requirements; as we better understand how to use the splendid resources provided by nature for our comfort and temporal happiness, we should remember the source from which all these blessings come to us. We should endeavor to make our lives and our actions voice our gratitude to God, the Creator of all things, and the Giver of all good gifts.

The last address of the morning session was that of Dr. H. H. Shoulders, Registrar of Vital Statistics for Tennessee. Dr. Shoulders' address follows:

SOME FACTS SHOWN BY THE TENNESSEE VITAL STATISTICS LAW.

BY DR. H. H. SHOULDERS.



From January 1 to October 1 of this year, 23,418 death certificates and 39,513 birth certificates have been filed with the Bureau of Vital Statistics. At this rate 31,224 deaths and 52,684 births will have occurred by December 30 of this year.

The relative part played by many diseases in producing this number of deaths is, of course, of vital interest to society.

A partial tabulation of the deaths reveals that a great proportion of the deaths was due to causes which are preventable. For instance, typhoid fever was the cause of 223 deaths during the months of May, June and July. Of this number 184 occurred in rural communities and only 39 in the four large cities of the State. Each of these deaths

might easily have been prevented. And, for this number of deaths to have occurred, there must have been more than 2,000 cases of the disease.

How can we calculate the loss which the homes of these typhoid victims sustained? Of course, the loss of time from work, the actual expenses during illness and funeral expenses would be enormous, but we cannot and should not attempt to weigh human life against dollars and cents. A great majority of these deaths were of people at middle age of life, and it is reasonable to suppose that a great number of them left fatherless or motherless children, with the misfortune of being orphans as their heritage. Who could estimate this loss?

You will observe that by far the greater portion of the deaths occurred in rural communities. In fact, in proportion to the population as great a number of deaths occurred in rural communities as in the cities. And many cases of the disease in the city were brought to them from the country for the advantages of hospital facilities, and in many other cases the disease is known to have been contracted in the country. So the figures show that the country people do not enjoy the degree of protection from this disease which city dwellers enjoy, notwithstanding the fact that the prevention of the disease in rural communities is very simple, and the means very inexpensive.

The disease is caused by a germ which occurs in the excretions of persons who are suffering from the disease, not only while the disease lasts, but for months after recovery, and occasionally for years after recovery. The germ must be swallowed to produce the disease. These are fundamental facts proven beyond all question to be true.

How, then, is the germ transmitted to the mouths of well persons? In brief, we can answer, in three ways: by fingers, by flies, or by water. Either one, or all, may be effective in transmitting the germ.

Fingers.—The fingers of the person who nurses the case become contaminated with the infection, and if they handle foods, of course contaminate the foods, which are swallowed. As we all know, "Mother" is often the nurse and the cook in the rural homes, and it is she who often innocently carries the germ from the patient to the foods of the remainder of the family. It is a horrible infection to be transmitted by such tender hands.

Flies.—The excretions from the patient are often disposed of in a careless manner on the premises of the rural home. Remember, too, the germs are in the excretions of those who have recovered, and when disposed of in a careless manner are of just as great danger. Flies have access to the excretions and to the foods in the dining room—of course, provided the room isn't properly screened. Thus the fly carries the deadly poison, and, unfortunately, they may bring the infection from insanitary premises hundreds of yards away.

Water.—The excretions of patients, or of the recovered, are disposed of in a careless manner on the grounds, the infection is washed by rainfall into the well or spring, or into streams which possibly empty into them. This occurs particularly in the limestone country of Middle Tennessee. In drinking water from such a well or spring the infection is swallowed.

The Prevention.—It was said a little while ago that the prevention of typhoid is simple, and it is. If excretions from human beings were properly disposed of on the premises of rural homes, the disease would cease to occur. Of course, care must be exercised by the person who nurses the case. The nurse should never be allowed to handle foods for well people, and then foods would not become contaminated. If the excretions from the patient were first treated properly with a powerful antiseptic, and the excretions from all well persons were disposed of in a sanitary privy, the infection could not be transmitted, for the reason that a sanitary privy has a water tight receptacle, or container, which will prevent soil and water pollution, and is screened so as to prevent the access of flies. Thus two potent factors in the transmission of the disease are blocked. The construction of a sanitary privy would cost about \$5. Not only typhoid, but other gastro-intestinal diseases would be prevented in this way.

Gastro-intestinal diseases of infants, that is diarrhea of infants under 2 years of age, and cholera infantum, were the cause of 761 deaths in the months of May, June and July. Of this number, 143 occurred in the cities and 618 in the rural communities. In comparison, the country is the greater sufferer from these diseases. The diseases are due to either filth or improper diet, which is due to either ignorance or negligence. If it be due, in a majority of cases, to ignorance, which it undoubtedly is, it would seem to indicate that country people should be better informed on these matters, and, too, it argues that we need to improve the machinery by which our country people are educated along these lines, and the machinery by which sanitary laws are to be enforced.

Tuberculosis was the cause of 1,032 deaths during the months of May, June and July. Of this number, 840 occurred in rural communities and 112 in the four cities, corresponding to a death rate of 177 per hundred thousand population per year in the country, and a death rate of 219 per hundred thousand per year in the cities. The country has some less death rate from this disease, but think of its advantages. The cities have sweatshops, crowded factories, crowded and poorly ventilated offices and tenement houses. They have the slums, they have poor children, half fed and poorly clothed. They have every facility for

transmitting the germ of the disease, and, in spite of these disadvantages, have a death rate from tuberculosis almost as small as rural communities. Evidently, country people need to be taught to take advantage of their surroundings in preventing this enormous number of deaths from this disease.

Great responsibilities rest upon the shoulders of farmers today. It is important that they not be handicapped by the havoc wrought by diseases which can be so easily prevented. These should take at least equal place in importance with hog cholera and the cattle tick. Tennessee is in sore need of a better rural health organization, and country people must demand this at the hands of their representatives.

The convention then adjourned until 1:30 p. m. During the noon hour there was a demonstration on the grounds of fire prevention as it affects the farmer.

AFTERNOON SESSION.

There was an increase in attendance at the afternoon session. The convention was called to order at 1:30 p. m. by President Gallagher.

The first number on the program was an address by Prof. John Lee Coulter, of George Peabody College for Teachers, Nashville, Tenn. Prof. Coulter's address follows:

CREDIT NEEDS OF SOUTHERN FARMERS.

BY PROF. JOHN LEE COULTER.



Let me address myself immediately to the problem in hand, and knowing that I am talking to a very representative body of Tennessee farmers, let me first call your attention to the fact that if you had lived even seventy-five years ago as farmers in this country, the question of farm mortgages would never have arisen. Plainly speaking, there practically were no such things and, therefore, no need for farm mortgage banks. At that time a popular song with farmers concluded with the line: "Uncle Sam has land enough to give us all a farm."

Why mortgage one's farm? Why borrow money to buy a farm when it was possible to go a few miles further west and squat on a piece of land that looked good, build a home upon it and

have the fact recorded on the public books. *The farm mortgage problem is a new one.*

But I may also say that if you had lived seventy-five or one hundred years ago you need not have considered—in fact, you could not have considered—the problem of personal credit, by which I mean the short term credit, as you are today. At that time, generally speaking, each farmer or each community at least produced practically all of the things it expected to consume, and, more than this, each community consumed practically all of the things it produced. There were no complicated buying and selling problems. There was no borrowing on a growing crop. Farm finance was very simple and, indeed, very primitive.

But we are living today, and not fifty, seventy-five or one hundred years ago, and, therefore, we have both problems of long-term farm mortgage credit and short-term personal credit, and we must face these problems.

But before going any further, let me call your attention to the fact that as cities, towns and villages commenced to appear on the horizon one hundred years ago, and merchants, manufacturers, tradesmen and other classes of people concentrated in cities, financial institutions were built up to serve their needs. We had private banks, State banks and finally National banks. But this whole banking system, including later the whole system of savings banks and trust companies, was built up to serve the people who lived in cities, towns and villages, and only incidentally to serve country people. Quite naturally, people being grouped together in large numbers found it easy to build up a financial system to serve their needs. Farmers, on the other hand, being scattered widely over the country, far from each other, had fewer needs and found much greater difficulty. They satisfied themselves as far as possible by using wherever practicable financial institutions built up in the cities. I believe the time has come for farmers to seriously consider the building up of financial institutions specifically to serve the needs of the country people. On the other hand, I am satisfied that, to a very large extent, the present financial institutions are of material service to the farmers.

Something more than two years ago a movement was started looking toward the establishment of some system of mortgage banks for the use of farmers in the United States. At the same time a movement was set on foot looking toward the establishment of rural credit associations to serve the personal credit needs, or the short term credit needs, of farmers. During this period very great progress has been made and I am pleased to appear before you today to give you some idea of the movement.

First, let us see the present situation with reference to farm mortgage banks. It was believed by those who were looking into the subject that it is not wrong to mortgage one's farm if, by borrowing money, productive purposes are kept in mind. It was believed that farmers might well borrow money and pledge their farms as security in order to erect better buildings, to remove stumps, stones and timber, to drain the farm, to irrigate it or in some other way to improve and develop the same. It was also thought desirable to create institutions which would make it possible for any man, who otherwise would be forced to live the life of a tenant, or hired laborer, to purchase a farm on which to live.

A commission was created by Congress, and this commission was charged with the duty of first carefully looking into American needs and, second, carefully inspecting European systems of mortgage banks, after which they were instructed to suggest improvements in the American methods of carrying on the farm mortgage business.

You have already been told that I was appointed by President Wilson to not only act as one of the members of that commission, but to serve as Secretary, and see that a report was compiled and perfected. The United States Commission on Rural Credits drew up a plan looking toward the formation of Farm Land Banks. A bill was drawn up to be introduced in Congress and a few months ago this bill was introduced in the Senate by Senator Fletcher, of Florida, and was introduced in the House of Representatives by Congressman Moss, of Indiana.

The purpose of this bill was to authorize the formation of farm land banks, with a Federal charter, authorized to do a general farm mortgage business. These banks were to be formed by any group of persons, either by farmers themselves or by people with money to lend, or any other group of citizens.

About the same time a popular agitation arose looking toward Government loans to farmers for this very purpose and this has been advocated extensively by some. The reason why the Government should not lend money directly to individuals has often been stated. In the first place, it means that the system would fall into the hands of political manipulators. In the second place, the amounts are billions of dollars. In the third place, why should the Government lend money to farmers and not to laborers working in mines, to town folks, indeed to all who apply?

It is often pointed out that farmers are better able than any other class of citizens to borrow money if proper financial institutions are provided.

A very large number of bills have been introduced into Congress of one kind or another, some looking toward direct Governmental loans, others suggesting a scheme of mortgage banks. I think it would be very wise for each of you to write your Congressman and Senator, urging that they pass the best legislation possible at the earliest possible date, at the same time asking them to send you forward all literature possible on the subject in order that you may study it more carefully.

It should be noted at the same time that the National Government created a commission to look into this matter a voluntary commission of nearly one hundred members spent some time investigating the situation in European countries. This was known as the Southern American Commission, assembled under the direction of the Commercial Congress. This commission published a very elaborate report, which you probably would be able to secure by writing to your Congressman or Senator.

But I only have a few minutes to address you and wish to give some attention to the matter of personal credit. It was the recommendation of the United States Commission that National legislation or State legislation be undertaken at the earliest possible moment looking toward the creation of a special set of financial institutions to provide for the personal credit needs of the farmers. No action has been taken along this line as yet by the National Government. On the other hand, the State of Massachusetts has for five years had a law providing for the formation of credit unions or small personal credit societies. Since the recent popular agitation, New York, Wisconsin and Texas have followed Massachusetts' example and have passed laws. I would strongly urge that you secure copies of these and study the present movement carefully.

If any of you favor State legislation rather than National legislation, it would be wise to start the popular movement looking toward the securing of two

State laws in this State, one providing for a system of farm land banks with State charters to do a general mortgage business, and the other providing for the creation of Credit Unions or Farmers' Personal Credit Societies to look after the short-term credit business—in other words, to negotiate personal loans. An examination of the reports which have been compiled recently will show literally thousands and thousands of these financial institutions in the rural districts of all European countries.

I realize the impossibility of giving you any adequate idea of the needs and possibilities in such a brief period. On the other hand, I trust that you may commence studying this matter seriously. Write your farm paper about it, asking them to publish articles and either place the matter seriously before your Congressmen and Senators in Washington or begin a vigorous campaign looking for State laws.

The next number on the program was an address by Dr. Willis B. Lincoln, of the United States Bureau of Animal Industry, stationed at Nashville. Dr. Lincoln's address was as follows:

MEAT INSPECTION.

BY DR. WILLIS B. LINCOLN, U. S. BUREAU OF ANIMAL INDUSTRY.

The increasing interest manifested by the public concerning all phases of general hygiene has extended to their food supply and especially to their meat. One is not surprised at this when he remembers that meat constitutes one of the very important foods of man. It is estimated that a little more than half of the total meat supply of the United States comes under the inspection of the Federal Government. Most of the remainder receives no inspection whatever, while a portion is subjected to a limited inspection by the state or local officers.

It was estimated that in 1890 the average amount of meat used per capita in the United States was 119.7 pounds, a ratio surpassed only by Australia. But when one realizes the great amount of meat and meat food products used by the American people he is in a position to realize the importance of the problem of procuring and maintaining a wholesome and hygienic supply.

The principal object of meat inspection is to protect the consumer from diseased or otherwise unwholesome meat. This involves not only the inspection of the meat for the detection of disease or other unwholesome conditions, but also the requirement of sanitary conditions and equipment in the abattoirs and packing-houses, and the requirement of sanitary methods in the preparation, curing and handling of the meat. To fulfill the first requirement there should be a competent veterinary inspection of the carcass at time of slaughter, as well as an ante-mortem examination of the animal and finally the supervision of the handling, curing, etc., of the meat. This can be done by the veterinary inspector with the assistance of laymen trained in the handling and curing of meat and the preparation of meat food products, such as sausage and lard. These men are to insist that the plant be kept clean in all of its many departments, and that all tables, trucks, vats, knives and machinery of all kinds be kept in a like condition—in one word, be kept sanitary.

At this point a brief account of the way meat inspection is carried on by the inspectors of the Bureau of Animal Industry of the United States Department of Agriculture will be of interest. I will not enter, however, into a description of the various diseases that might be mentioned on account of lack of time. Ante-mortem examinations are made of all animals intended for slaughter in packing-houses having Federal inspection. These inspections are highly important, as there are certain diseases and conditions not attended by any microscopic lesions in the carcass, although they are noxious and repugnant. Those that have been condemned on ante-mortem inspection which fail to show on post-mortem sufficient lesions to warrant condemnation are passed for food, while all carcasses not fit for food are tanked.

Post-mortem inspection is of the greatest importance, as there are a number of diseases in which the determination of the unhealthfulness of the meat must depend entirely upon the post-mortem examination, and many animals are condemned at this stage that have passed ante-mortem inspection, so one can see that the careful carrying out of the details of these two associated methods of inspection is to be greatly desired.

The detailed method of post-mortem inspection is about as follows: After the head of the animal is removed, or cut in such a way as to make it possible, the cervical lymph glands are incised for the detection of tuberculosis; the muscles of the jaw and tongue are examined for evidence of tape-worm cysts; then as the animal is eviscerated, the various lymph glands, as the bronchial, mediastinal, portal and mesenteric, are incised, the lungs are palpated, the heart, kidney and spleen carefully examined, and the general condition of the entire viscera noted. Should evidence of tuberculosis be found, the important body lymph glands, such as the prescapular, sublumbar, superficial and deep inguinal glands, are examined in order that the extent of the disease and the proper disposition of the meat may be determined.

The principal conditions requiring condemnation are hog cholera, swine plague, rabies, malignant epizootic catarrh, septicemia and pyemia, also advanced forms of scabies and actinomycosis, inflammation of the lungs, pleura, peritoneum and intestines, Texas fever, generalized or extensive tuberculosis, advanced pregnancy or recent parturition, immature animals, animals too emaciated or anemic to produce good meat, cancer and other tumors, and abscesses, tape-worm cysts, various skin diseases, and a few other diseases only occasionally met with.

As you can readily see, the inspection covers a very extensive field, and not only safeguards the health of the consumer, but safeguards the live stock industry as a whole by the early detection in many cases of outbreaks of hog cholera, foot and mouth diseases, scabies of sheep and cattle. Thus the origins or centers of various diseases are constantly being discovered. It not only protects the consumer from meat of tuberculous animals but puts us in position to trace down cases of tuberculosis in animals, which information is furnished by the Federal to the State officials and thus helps them materially in their work of eradicating this terrible scourge.

The curing and handling of meats and the preparation of meat food products is supervised by trained men, as before indicated, and all meats and meat food products that are not in a sweet, clean and sound condition are condemned, such as sour hams, shoulders, or sides, or sour sausage, rancid and sour lard;

in fact, any and all products intended for human food must be in the very best condition. No preservatives, except salt, sugar, saltpeter, the various spices and smoke are allowed to be used. If cereal is added to sausage its presence must be indicated by the proper label or mark.

We insist on absolute cleanliness in all the steps of preparation. The establishments are thoroughly cleaned every night. Of course, during operating hours the floors, etc., have more or less blood, water and such like upon them, but this cannot be avoided. It could be likened to the carpenter's shavings in his shop. There are few kitchens in this country that are cleaned up every night as well as we insist upon the killing-floor, sausage room, lard floor, etc., being cleaned after the day's work is completed. All carcasses condemned on account of various diseases enumerated, all meats and meat food products condemned on account of sourness, rancidity, and dirty or unwholesome condition are placed together with a certain amount of floor scrapings, intestinal contents and other filthy substances in the offal or fertilizer tank, and the top and bottom of the tank sealed by an inspector. Steam is immediately turned into the tank and the meat is thus destroyed for food purposes under the supervision of an employee of the department.

All meats and meat food products are branded or labeled, showing them to be from U. S. inspected and passed carcasses. This is for the information of the consumer, so that he may know the meats, etc., are wholesome.

Such, in a brief way, is our method of carrying on the work of Federal meat inspection.

When one considers the fact that 2 per cent of the carcasses undergoing Federal inspection are affected with some condition making it necessary to condemn them either in whole or in part, and that of these condemnations nearly 87 per cent are due to tuberculosis alone, 1 per cent of the cattle and over 2 per cent of the hogs slaughtered under Federal inspection were affected with this disease to a greater or less extent, and while a very large per cent of the cattle killed at Federal-inspected establishments are drawn from the feed lots and ranges of the West where tuberculosis is rare, that the dairy herds of this country are estimated to have 10 per cent of their animals affected with tuberculosis, and that a large number of these dairy cattle are killed at small local establishments without Federal inspection, the necessity of local inspection to take up the work which the Federal government does not do can be realized.

The Federal inspection system depends for its authority upon what is known as the interstate and foreign clause of the Constitution of the United States, and this inspection is therefore limited to the product of establishments engaged in interstate or foreign trade. The Federal government is powerless to exercise any supervision over a packing or slaughter-house, the meat of which is slaughtered, prepared or sold and consumed entirely within a single State. It is therefore the duty of the State or municipality to establish and maintain a system of meat inspection that will afford adequate protection against diseased and unwholesome meats, so that all meat sold locally which has not passed Federal inspection will come under the requirements of an efficient local inspection system.

The uninspected slaughter-houses have as a rule many features that are not only objectionable but dangerous to health. The smell of the country slaughter-house is well known, and the conditions at some of these are inexpressibly foul and filthy. They are as a rule located in out of the way places, sometimes on

streams, thus polluting the water, and therefore are prolific means of the spreading of diseases, such as hog cholera, tuberculosis, tape-worms and other animal parasites, some of which are dangerous to man. These objectionable conditions are not confined to little slaughter-houses in small communities but are found in many of our larger cities.

It seems to me that on the ground of the prevention and eradication of tuberculosis in the human family, as well as from the various breeds of live stock from which we as a people derive such a large part of our food, as well as a large part of our material welfare, justifies the expenditure of the money necessary to provide for local inspection.

At these local slaughter-houses the inspection should be done by veterinarians wherever possible. If not possible, then it should be done by physicians, and they should have some veterinary training, as otherwise they would not have the required knowledge of animal diseases, and would not be able to recognize such diseases as readily as a veterinarian would. It is part of the veterinarian's special education not only to know about animal diseases but to know, so far as science has determined, whether or not they are communicable to man, and to know when diseases and conditions found in animals are likely to be detrimental to the health of the human consumer of the meat.

Whenever it is necessary that laymen be employed to carry on the work of inspection, either by themselves or as assistants to veterinarians or physicians, they should have received special instructions in meat inspection under competent instructors. To distinguish with certainty between good and bad in the meat supply is to the experienced inspector not a difficult task when the carcass represented is an extreme, but for these cases on the border line the rendering of a satisfactory and accurate conclusion is not so easy as might appear, for it is very difficult at times to say what should be accepted and what should be rejected.

Owing to the impossibility of constructing rules covering every case and the difficulty of asserting at what stage in its development a process becomes loathsome or a disease noxious, the decision as to the disposition of a certain number of carcasses must be left to the discernment and individual judgment of the inspector. Therefore it will be seen that the need of trained inspectors is all the more necessary.

If it is impossible to have regular meat inspectors, I would urge the various county and city health officers in the round of their regular duties to take a little time when they can conveniently do so to take notice of the sanitary conditions of slaughter-houses and premises in their vicinity, and to prohibit the feeding of offal to hogs at such places. Such could be done as one is passing along near in the discharge of his regular work, without much loss of time, until a regular man could be arranged for. Besides, it would be educational, preparing the way for the enactment of laws for the establishment of an efficient system of meat inspection in city and county. This will, I have no doubt, before long come to pass, and it will be of incalculable value to you in maintaining the health of your live stock as well as the public health.

The next number on the program was an address by State Superintendent of Public Instruction S. H. Thompson. Prof. Thompson's address follows:

THE TEACHER AND THE FARMER.

BY STATE SUPERINTENDENT S. H. THOMPSON.



A real teacher is one who is able to help the farmer in things outside of mere theories. He is a leader in his community. I once knew a farmer to ask a teacher how many bushels of corn could be put away in a crib 40 feet long, 10 feet wide and 8 feet high. The teacher was unable to tell him. Of course that teacher had poor standing in that community after that and his usefulness was almost at an end. I knew another teacher who was able to compute the number of tons of hay in a stack, which at once placed him in the lead in that neighborhood.

The teacher should be able to teach lessons in thrift. To some people, even some teachers, there is no such idea as

thrift. There is no greater lesson to be learned today than that of economy. I verily believe that we waste more than we use.

The question of marketing is one generally overlooked and the teacher could do much along this line if so inclined. It will take a little study, but it is far more important what the rural teacher does from 4 o'clock in the afternoon to 8 o'clock the following morning than from 8 o'clock in the morning until 4 o'clock in the afternoon. The study the teacher does at night may help the farmer in many ways.

Another great thing the teacher may do for the country man is along health lines. It is a mistaken idea to think that the man who lives in the country is necessarily a healthy man. Often it is just the opposite. Living in the country frequently puts people at the disadvantage of being away from a good physician or in places where sanitation is poor. Therefore when one is ill doctors and medicine are far away.

In this State more than 4,000 people die annually from tuberculosis. Half these deaths, or more, are purely unnecessary, as this is a curable and preventable disease. But too often when there is a case of it developed in a neighborhood the patient is placed in the closest room in the house and all the doors closed and the room is made uninhabitable for a well person, much less one already ill. The disease is infectious and people take no precaution to prevent its spread. The disease is not one to be inherited.

We have yet to learn it seems that typhoid fever may be had only by taking the germs inwardly. Two per cent of all the people who die in this country die from this disease. Most people who have it are never entirely well again. Colds are useless, yet more people have died from colds than have been killed in battle or than have died by pestilence. So long as people breathe through their nose they will not have colds. Fresh air and sunlight are entirely free and they are the very best antidotes for the diseases mentioned above.

The real mission of the school teacher among the farmers is to help the farmer to something better than he already has. To do this we must be prepared for many things, of which those mentioned above are only a few.

Following the address of Prof. Thompson, the convention heard an address from Mr. F. W. Gist, Special Agent of the United States Department of Agriculture, on "The Farmer's Cash Income," after which adjournment was taken until 7:30 at night.

NIGHT SESSION.

The convention met at 7:30 with a good attendance. In the absence of President Gallagher, Col. Jesse Tomlinson presided.

Mr. James Palmer, of Nashville, delivered an interesting address on "Good Roads," illustrated by some stereopticon views, showing the value of good roads to a community, and also the necessity of keeping the roads in repair. Mr. Palmer's address follows:

GOOD ROADS.

By JAMES PALMER.



The day has passed for any talk to be made on the necessity for good roads. This part of the work is fully understood. So I will confine my remarks to some of the evils that beset road building.

First, there is graft, where the building of the roads is a secondary consideration. The main object was to get graft for the boys. They needed the money. I refer to other States, not Tennessee, on this point. A species of graft has been carried on in some of our counties; many a bond issue for road building has been threatened with defeat unless more than they were entitled to was spent in some remote part of the county.

Another evil is too much enthusiasm at the start, which has resulted in overbuilding, and taxes made burdensome, with nothing left for maintenance. A road had better not be built unless you have reserved resources for its upkeep. Many roads are laid out to go over a hill, instead of around it. Again they follow the bed of streams, and often they zigzag about, serving as the line between farms.

To remedy these things we ought to have a highway commission with power to employ an engineer of ability to work with the engineers of the different counties and lay out a correct system of roads, regardless of the likes or dislikes of local people.

It would be better if we would go a little slower and first grade an earth road, and use the split log drag until you are able to metal it. The earth road is serviceable and inexpensive when maintained by a split log drag, which is one of the best and most useful instruments ever invented for the care of roads.

The Department of Agriculture of the United States publishes in pamphlet form all the details of road building, to be had by anyone on application.

The automobile truck is destined in the very near future to play an important part in the transportation of farm products from remote localities to the markets of the country. We should commence now to build our roads and get ready for the new era of things.

With good roads will come electricity to the farm house for lights and to run much of our farm machinery. A workman has to be fed and clothed, an animal has to be fed. Electricity requires neither food nor clothing. So it is to the interest of the farmer to hasten the day when these things will be at his door.

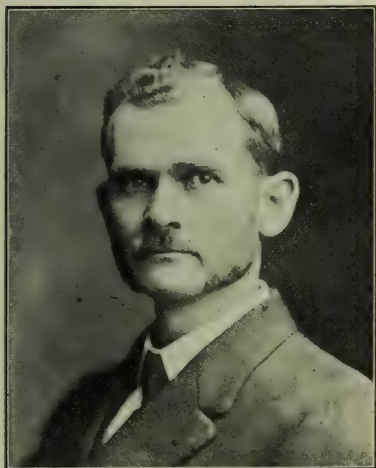
Convicts are being worked with great success on public highways in the following States: California, Georgia, Illinois, Kansas, Missouri, Montana, New Mexico, Virginia, Wyoming, Colorado, Utah, New York. We should try it in Tennessee.

The outdoor exercise and fresh air are advantageous to the health and morals of the convict, two things which should be given consideration in the handling of this class of men. Moreover, it permits the convict to feel a sense of responsibility in being placed on his honor to do work to be used by and inspected by the entire public, and the more a man can be prevailed upon to feel responsibility the more likely he is to become a good citizen.

The next number on the program was an address by Dr. J. S. Ward, State Inspector of Apiaries. Dr. Ward's talk was illustrated by stereopticon views, and was very much enjoyed by the delegates. His address follows:

LOCATING AN APIARY.

BY DR. J. S. WARD, TENNESSEE STATE INSPECTOR OF APIARIES.



One branch of farming which has been greatly neglected in Tennessee, as in other States, is bee-keeping. The honey-bee may well be counted as a friend of the human race, since besides furnishing large quantities of the most healthful sweet known, the commercial importance of which is by no means insignificant, it is also of greater value as a fertilizing agent to many of the crops produced by the farmer and horticulturist, obtaining results which could not otherwise be secured.

Bee-keeping on a commercial scale is far from being a royal road to wealth, as pictured by some, but requires as much labor, diligence and attention to details as many other lines of business. However, the thoroughgoing apiarist, well adapted and educated to the business, given a good location and a favorable season, usually has no complaint to offer. As along other agricultural lines, weather conditions often exert an adverse influence, and poor seasons intervene, which necessitate extra care, fortitude and enthusiasm on the part of the bee-keeper to safely bridge them over.

The summer of 1913 was a very favorable one for the bee-keepers in Tennessee, while the summer of 1914 was very disappointing. In most of the States the white clover honey flow was a complete failure. However, these failures do not come often, and from year to year the bee-keeper who is careful and painstaking can count on an average of not less than \$5.00 worth of surplus honey from each hive. The yield from my own yard in 1914 was about \$12.00 for each hive.

In bee-keeping may be found light, profitable employment for those who are unfitted for more strenuous labor. Many women are succeeding with bees. For the general farmer a few colonies of bees will require but little labor and time and if they are rightly managed will yield a generous supply of honey. There are many small farms which are managed along the line of poultry, fruit and truck farming, where bee-keeping could be added with a considerable increase to the home income.

The number of colonies of bees that may be profitably kept in one locality depends altogether upon the quantity of honey-producing plants which are grow-

ing within two or three miles of the apiary. Doubtless there are but few localities in this State in which a few colonies of bees could not be kept with profit; but when a person expects to make a specialty of the business it is highly essential that he should study thoroughly any given location to determine its possibilities in honey production before he concludes to settle down permanently.

Many sections of Tennessee, particularly the middle, furnish the finest quality of white clover honey obtainable. Years ago poplar and basswood were prolific sources of honey in many localities, but now they are mostly confined to the mountainous districts of East Tennessee. Alfalfa is a splendid honey plant in the Western States, but is very poor this side of the Mississippi River.

In sections where buckwheat is grown extensively a good yield is frequently obtained, and very seldom is a total failure experienced, since the season of blooming is late and all colonies in good condition to gather the nectar.

Alsike clover is abundant in many sections and is a splendid honey producer. Fruit bloom and black locust occasionally yield honey freely, but come on before most of the colonies are very populous, hence do not afford much, if any, surplus, but are very useful to promote breeding.

Where the bee pasturage is scanty too many colonies in one apiary will result in overstocking the range and the bees will not do so well as they otherwise would; but in most localities bee pasturage is plentiful enough for at least several dozen colonies to succeed in gathering a surplus of honey.

Having found a desirable location as regards pasturage, etc., there is still another very important point for consideration, namely, whether there are any apiaries of considerable size within four or five miles of the point in question. If so, the newcomer is advised to pass along to a locality that is free from large apiaries, since most localities may be overstocked with bees, as many are at present. It is the height of folly for an apiarist to locate an apiary near one already established, as the profits are then divided, the full amount of which might be enjoyed by each if separated a few miles.

The number of colonies that may be kept in a single apiary with the maximum of profit can be determined only after a careful study of the resources of the section in which the apiary is located, within a series of years of experience, and by adapting the management and manipulation to the requirements of such locality. Seventy-five to one hundred colonies should be the limit until experience proves that the number may be increased.

The successful apiarist must acquaint himself with the honey-yielding flora of his locality, the time of blooming of each variety, and the length of time it may be expected to continue, that he may prepare for the harvesting of the surplus crop by having his apiary in proper condition at the right time, with the necessary equipment at hand and ready for application.

The science of bee-keeping has advanced as rapidly as any other branch of farming, and the bee-keeper who does not avail himself of the latest knowledge and methods of management is working at a disadvantage. There is so much that is fascinating and marvelous about the lives of the industrious little toilers that once a man becomes interested in them he is likely to become an enthusiast on the subject.

The convention then adjourned until 9:30 o'clock Wednesday morning.

SECOND DAY—WEDNESDAY, OCTOBER 7, 1914.

MORNING SESSION.

The convention was called to order at 9:30 o'clock, with President Robert Gallagher in the chair. There was an increased attendance of delegates, and the weather was ideal.

President Gallagher announced the appointment of the following committees.

COMMITTEES APPOINTED.

Committee on Resolutions: M. L. Taylor, Cumberland County; J. H. Porter, Williamson County; J. N. Meroney, Maury County.

Committee on Nominations: G. W. Phillips, Bedford County; Prof. A. S. Hill, Giles County; A. E. Murphy, Maury County.

The first number on the printed program was an address by Prof. H. A. Morgan, Director of the Experiment Station, University of Tennessee. Prof. Morgan was unable to be present, and in his stead Prof. J. C. McAmis, of the University of Tennessee, delivered an address on "Methods of Soil Management."

Following Prof. McAmis, Dr. George R. White, State Veterinarian, delivered an address to the convention on "Hog Cholera and Serum Treatment." Dr. White's address follows:

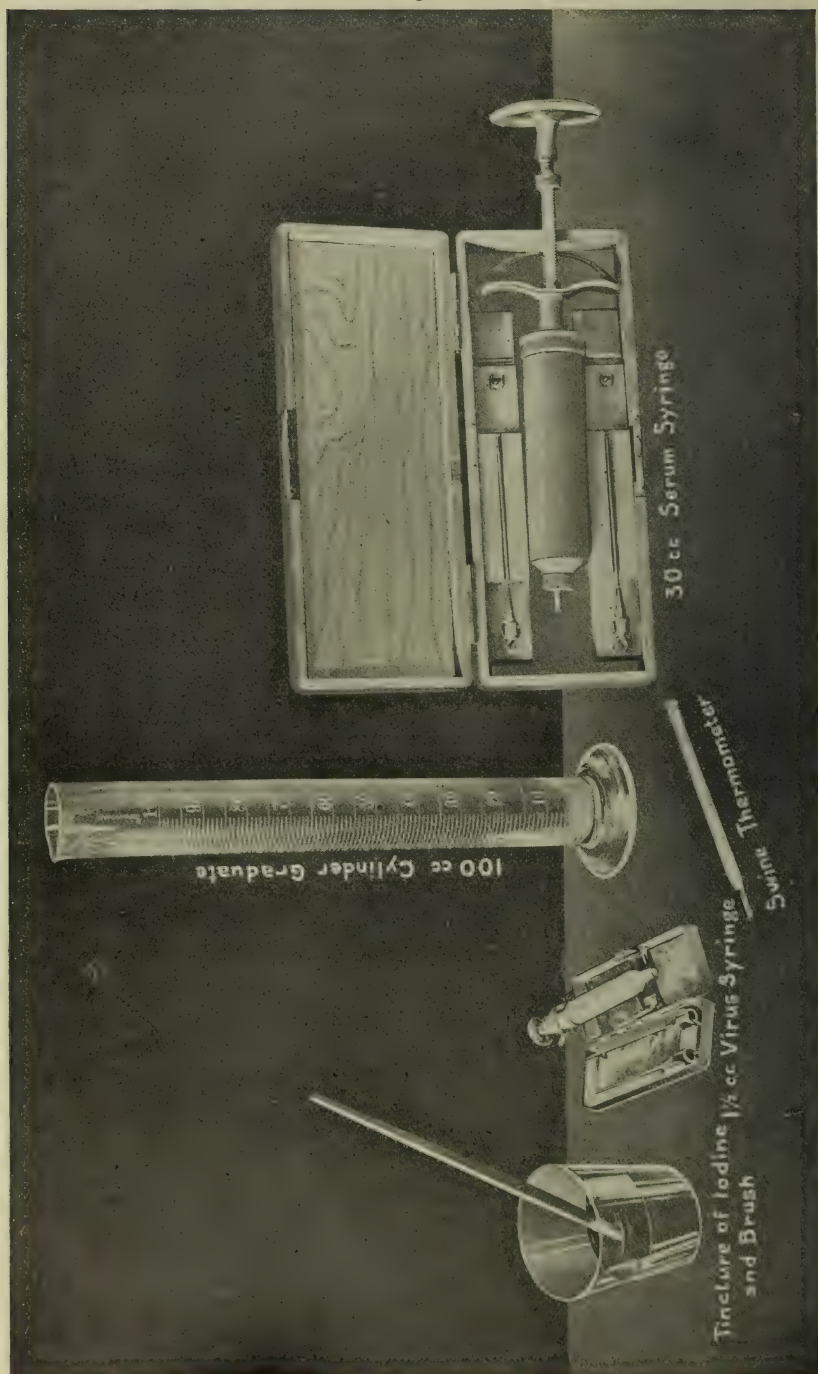
HOG CHOLERA BASED ON SERUM TREATMENT.

BY GEO. R. WHITE, M.D., D.V.S., STATE VETERINARIAN.



I am often asked the question, What is hog cholera? About the best answer I am able to give at this time would be that hog cholera is an acute, subacute or chronic contagious disease of hogs caused by a filterable virus, the specific micro-organism ("germ") of which has never yet been isolated or described by any laboratory or field worker. It is characterized by extreme contagiousness and a high death rate, and does not affect any animal except swine.

Swine values in the United States total many thousand over one billion dollars. Authorities claim—and I believe justly so—that the annual losses from the ravages of cholera in this great country of ours amounts to between



Instruments and Utensils Used in Vaccinating Hogs.

fifty and sixty million dollars. This is to us a tremendous drain in the way of actual losses. It is appalling when we pause to think that cholera is a preventable disease and one easily and cheaply controlled.

The 1910 Federal Census gives Tennessee 1,386,050 head of swine, valued at \$7,320,377.00. By what we consider a conservative estimate based upon reports of reliable and well-informed men from most every county in the State and from our own personal observation and other dependable sources of information, we have claimed, and do now state, that no less than 400,000 hogs, valued at \$2,250,000.00, died in Tennessee during the year 1912 from hog cholera.

Any disease which causes such money losses in one year in a State as small in area as Tennessee certainly deserves the most careful consideration from all persons who are either directly or indirectly involved. With those 400,000 hogs that died last year from cholera made into bacon and lard some part of the present high cost of these two essentials to our existence would be solved. The control and eradication of hog cholera does not by any means involve or concern or affect the pocketbook of the swine owner alone, but every meat consuming citizen has a share—from an economic viewpoint—in the success of such an undertaking. Since the price of pork and pork products are based upon supply and demand, it is logical to conclude that for every hog that dies from cholera there is one less hog with which to feed the people.

Two million two hundred and fifty thousand dollars represents only the direct annual losses. The indirect losses caused by discouragement of the swine-raising industry amounts to equally as much as the direct losses.

If cholera were not dreaded, it is quite probable that instead of only 1,386,050 head of swine, Tennessee would be producing at least 3,000,000 head. Many farmers who are now raising only a few hogs each year would raise many if cholera were not feared. I know of at least one breeder who stated to me that he had tried hard to raise two hundred hogs a year, and that "cholera wiped them out at least two years out of every five." Sometime ago he took it upon himself to investigate the efficiency of the Dorset-Niles Anti-Hog-Cholera Serum. After investigating, he was impressed with its merits and later stated that instead of trying to raise two hundred hogs a year he expected in the future to raise one thousand, and that he expected to make it a point to know that each one of them was an immune.

The first outbreak of hog cholera about which we have any authentic data occurred in the State of Ohio in the year 1833. Since that time it has spread to every State in the Union and throughout almost every European country. Its first occurrence in England was in 1862, where it has since appeared from year to year, causing in one year (1896) the loss of as high as 30 per cent of all swine in that country. It appeared in Sweden in 1887; Denmark in 1889, at which time it also made its first appearance in France. It reached Hungary in



Injecting Serum Behind Shoulder (Large Hog).

1895. The losses in these foreign countries appear to be equally as heavy as those in the United States. There has been only a very few outbreaks of hog cholera in Canada, hence Canadian laws in regard to importation of swine from the United States are very rigid, as the authorities there hope by this means to prevent cholera gaining a foothold in Canada.

Although only four years have elapsed since the Dorset-Niles Anti-Hog-Cholera Serum was perfected there are at this time twenty-three States engaged in making the product. These State plants cost \$299,000.00. In addition to the State plants there are no less than seventy-six private or commercial plants manufacturing and distributing serum in the United States.

Two methods of vaccinating are in vogue, viz.: serum alone, and simultaneous method. The *serum alone* method means injection of serum without virus. This method only affords temporary immunity—three to six weeks. We do not advocate or even indorse this method as the immunity does not last long enough to justify the expense.

The *simultaneous method* consists in the injection of a small amount of virus at same time serum is injected. This method affords life immunity and does not cost one cent more and does not require one minute additional time than the serum alone method. This *simultaneous method* has our unqualified indorsement and is the only one we advocate.

The proper time to vaccinate hogs is before they become sick. If you wait until they are standing around with ears drooping, backs arched, noses to the ground, no appetite, hind legs partly paralyzed and temperature above 105, it is certainly too late to save all of them and oftentimes the majority will succumb even in spite of serum treatment administered in double doses.

The protection of young pigs from cholera is the "knottiest problem" which the department has been called upon to solve; however, from our own experience and the experience of others, we are constrained to summarize the young pig problem as follows:

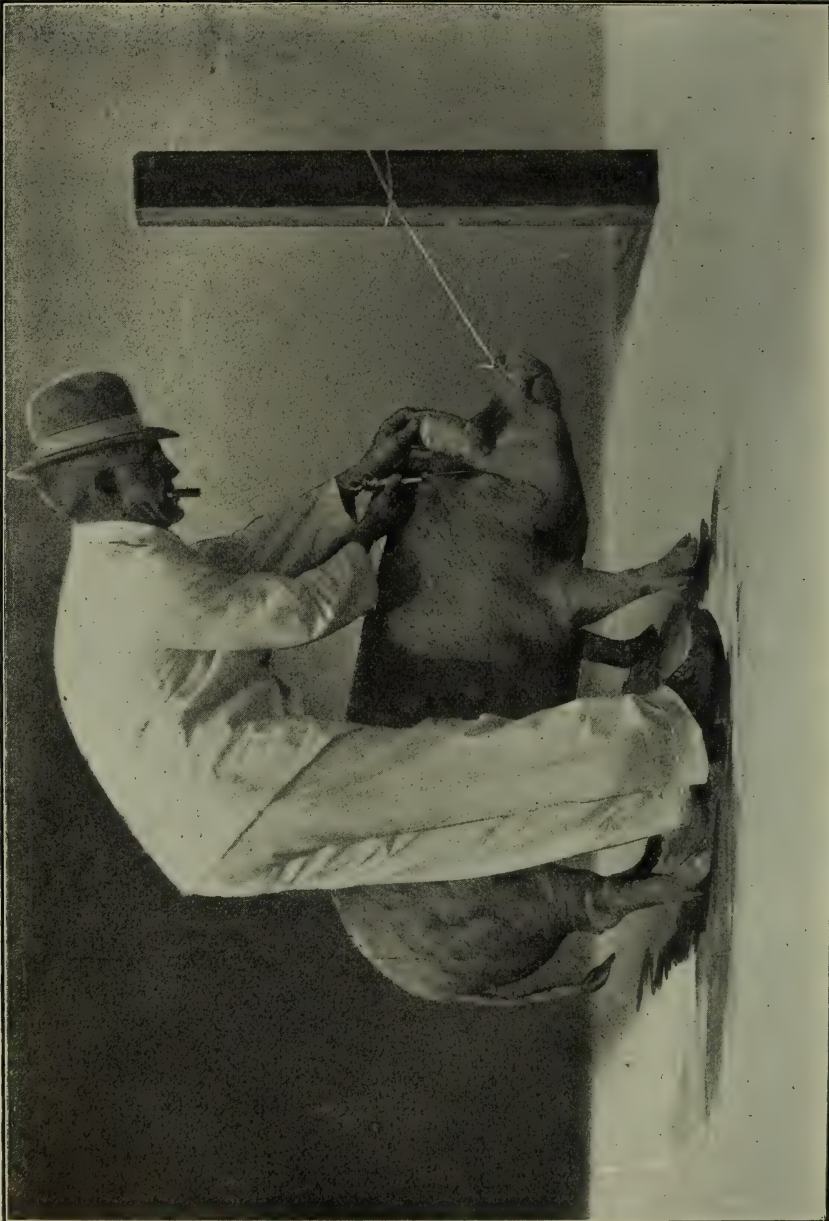
We know that suckling pigs are extremely susceptible to hog cholera and that when they contract it the death rate (mortality) is very high—oftentimes 100 per cent of them die.

We know that it is impossible by any known method of vaccination to get life immunity in any large per cent of suckling pigs.

We know that pigs from immuned sows are themselves immune so long as they are subsisting *alone* on their mother's milk, but that as soon as they begin to eat other food—which is at 14 to 18 days of age—they become susceptible to hog cholera.

Looking at it from every phase, our advice is as follows:

1. Unless the pigs are in actual danger of hog cholera defer vaccinating them until they are weaned.
2. If cholera infection is already on the farm or in close proximity thereto you are justified in vaccinating with serum alone.



Injecting Serum Behind Ear (Large Hog).

3. If forced to vaccinate suckling pigs, you should revaccinate after they are weaned in order to insure *life* immunity.
4. A pig is never too young to vaccinate if it is in immediate danger of hog cholera.

DIRECTIONS FOR VACCINATING.

1. Sterilize instruments by boiling.
2. Wash your hands.
3. Carefully estimate weight of hog.
4. Restrain the hog by holding or otherwise.
5. Paint site of injection with tincture of iodine.
6. Wash mouth of serum and virus bottles.
7. Measure amount of serum with graduate and pour serum into barrel of syringe.
8. Replace syringe piston and cap.
9. Fill virus syringe with required amount of virus. See label on serum bottle.
10. Inject serum behind ear or behind shoulder of one side and virus on the other side. If more than one syringe is to be used, withdraw the needle and make the second injection on opposite side, in which event virus should be injected into some other site.

The few failures or unfavorable results which have been reported may be attributed to one of the following three causes:

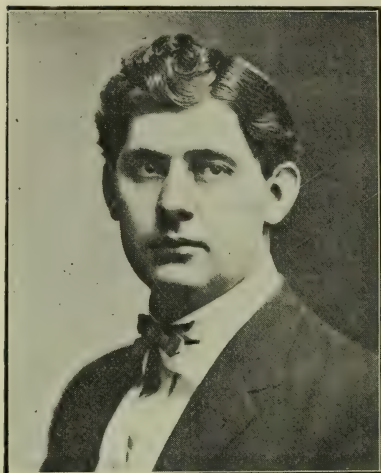
- (a) Underestimating the weight of hogs.
- (b) Treating sick hogs with well hog doses.
- (c) Treating chronic cholera.

Whenever you underestimate the weight of a hog you fail to give a sufficiently large dose of serum to protect him from the virus administered. Here I desire to re-emphasize what has been stated many times before. *Give enough serum.* Don't cut the dose down 10 c.c. in order to save 15 cents, for in so doing you may be killing a hog worth \$25. Don't treat sick hogs with well hog doses. Sick hogs require double doses. The only way to determine the fact of sickness is to take temperatures. If temperature is over 104 the hog is already infected. Into such a hog you are supposed to put a double dose of serum and no virus. To those showing a temperature of less than 104 degrees give the simultaneous treatment. There is nothing quite so important in vaccinating hogs as taking temperatures. You may expect to lose from 25 to 35 per cent of sick hogs treated even with double doses. Of course this applies to acute cholera—hogs which have not been sick over eight days. Don't treat chronic cholera, as it is a useless waste of serum. If a hog has been sick over eight days serum even in double doses will do it no good. It is well also to remember that in chronic cholera the fever has oftentimes dropped down to normal or even below normal. In such cases the thermometer cannot be depended upon for diagnosis. After the ulcers form on the intestines (eight days) a hog will die as quick with serum as without it. *Don't treat chronic cholera.*

The next number on the program was an address by A. L. Garrison, Chief Feed, Seed and Fertilizer Inspector of the Department of Agriculture. Mr. Garrison's address follows:

FEED, SEED AND FERTILIZER LAWS.

BY A. L. GARRISON, CHIEF FEED, SEED AND FERTILIZER INSPECTOR.



Gentlemen of the Convention:

This is the fourth time I have had the pleasure and opportunity of addressing the Middle Tennessee Farmers' Convention on the subject of Feed, Seed and Fertilizer Control, which I cannot help but believe is the most important subject that can be considered by the farmers of the State.

There is so much subject-matter in this question that I want to assure you that I am not going to thresh old straw. Allow me to first call your attention to our feed law, which is now being enforced to the letter and is giving ample protection to the consumer, and equal satisfaction to the manufacturer. It is not within the province of this

Department to say what is best of certain feeding products, but our duty is to see that the consumer gets a square deal and gets what he buys—whether it be 41 per cent cotton seed meal or 20 per cent cotton seed feed.

We have made a determined and successful fight since 1907 against by-products of little or no feeding value. It is not meant that we are opposed to the consumption and utilization of all products; but the point is, we are, have been and will continue to be aggressively opposed to the low grade elements being used as adulterants for the high grade. For example—corn cob meal mixed with wheat bran and sold as pure wheat bran. We have succeeded in putting many of this class of manufacturers out of business.

It is with some degree of pride and of much gratification that we can state now most emphatically that the consumers of concentrated feeding stuffs are at present getting a square deal from the producer. The law is being enforced fairly and impartially and it is giving the relief sought in its enactment—protection to the honest manufacturers and dealers as well as to the consumers against the adulterators.

FERTILIZER.

What we are able to say relative to feed stuff can also be said of commercial fertilizer. When a firm brands its goods as containing so much nitrogen, potash and phosphoric acid, they are exceedingly careful to have it come up to the guarantee. One of the greatest aids to the enforcement of our agricultural laws has been the establishment of a complete laboratory. This institution stands guard over the farmer's interests, and has the same terrors for the unscrupulous as the bull dog has for the burglar.

SEED LAW.

The third law which I desire to call your attention to is that regulating the sale of field seed. This subject is of vital concern to every farmer and

gardener in the State. We have been unable to get the results from this law that we had hoped. I want to assure you that this condition has not been brought about by lack of effort on our part. I want to be just as positive in the statement I am about to make as is in my power. It is this—the farmers of this State and the entire country are facing a crisis in the production, sale and distribution of field seed and the standard must be raised.

How this is to be done is the perplexing question which confronts us. We have so far determined that the pressure must come from the outside—from the farmers themselves. In other words, there must be a complete and hearty cooperation between the farmers of the State and the officials who have the law in charge. Until this condition is reached we may expect to find on the market impure and low-grade seed. The consumer creates the demand for any commodity.

Of the many problems that confront the progressive farmer today none is worthy of more consideration than that of proper seed selection, and it is feared that in many instances this important point receives only secondary consideration.

Just as we find many farmers making the mistake of buying low grade fertilizers, because they cost less money, so we find an equal number buying the seed that can be had for the least cost, and in both cases it is the farmer himself who suffers and loses money.

When the farmers realize that some other consideration than the price must be the guiding factor in buying, and that the lowest priced seed are not the cheapest, but that the purest seed are the cheapest in the end, then will we see a marked improvement in the seed conditions in the State. If the farmer will demand the purest seed and will have no other, the dealers will be compelled to meet this demand.

The initial cost of the low grade seed may be less, but when harvest time comes around, a little figuring will show that the supposed cheap seed were not near the bargain that they appeared to be in the spring. The two main requisites of good seed are purity and high germination, and when seed shows up well in these two factors, it is reasonable to suppose that such seed will give a good stand if planted under the proper conditions.

PURITY.

By purity is meant as high as possible a percentage of pure seed, and freedom from other kinds of seed, dirt, sticks, chaff, etc.

The various seeds on the Tennessee market this year show, upon examination, a very wide range in purity, running from as low as 40 per cent to 99 per cent pure seed.

Now, suppose that the seed of 40 per cent purity could be bought for one-half of what the seed of the 99 per cent purity would cost, does it look like economy to buy the low grade seed, even at that price? It certainly would not be economy, for if two bushels of the low grade seed were sown on the same area as one bushel of the high grade seed, you would still fall 19 per cent short of having the same number of pure seed on the plot where the low grade seed were used.

But this is not by any means the only objection to the use of low grade seed. The difference of 60 per cent between 40 per cent and the total of 100 per cent is made up largely of objectionable weed seed, which unfortunately, as

a rule, have a high germinating factor. These weed seed will probably germinate at the same time, or before the agricultural seed, and as they are in the majority, it is more than probable that they will choke out the few good seed and the farmer will find himself with a fine crop of weeds, where he expected a crop of clover, red top or timothy. The example given above is an exceptional case, and such very low grade seed are not at all common.

But the work done this year shows a very large number of the seed on the market to contain excessive amounts of foreign seeds, and while those foreign seed may not to such a great extent injure the crop during its growth, they will certainly have a very decided effect upon the quality of grain or seed produced, lowering the market value of the grain in direct proportion to the amount of foreign seed it contains.

It should also be borne in mind that weeds have the ability of consuming the plant food of the soil, in some cases more rapidly than the valuable plants, thus robbing the growing plants of what they would otherwise get.

The bad effects of the use of impure seed may be summed up under the following heads:

1. A poor stand, due to the limited number of good seed in a given amount.
2. Choking out or retarding the growth of the crop.
3. Consumption of plant food, thereby depriving the crop of the food necessary to its growth.
4. Lowering the grade, and consequently the market value of the crop.
5. Rendering the seed from such a crop absolutely unfit to be used as seed for planting.

GERMINATION.

After having satisfied ourselves as to the purity of a seed, we still have no definite evidence that the seed is all that it should be. It is possible to find a seed absolutely free from foreign seed which for some reason won't give a stand even when planted in liberal amounts. Such a condition is termed low germinating power, and means that for some cause the seed will not germinate or sprout. This condition may be attributed to the seed being sterile, or unfertile, caused by improper mixture of pollen during growth. It may also be due to age of the seed, as some species of seed lose their germinating power after they reach a certain age. For example, rye, that shows a high germination the first year, is liable to show up very deficient if sown the second or third year, after being harvested.

Bad handling and improper storage are other factors that affect the germination of seed, and should be guarded against.

After we have determined the purity and germinating factors of seed to be what they should, we still have another question to consider, and this is whether or not the seed is adapted to our climate. This can be determined by inquiry into where the seed was grown; if the climate where the seed was grown is similar to our climate, then we can reasonably presume that it should thrive here.

The pure seed law requires that each package of seed containing one pound or more, offered for sale in Tennessee, shall be accompanied by a plainly printed statement certifying:

1. Name of seed.
2. Full name and address of seedman, dealer or agent.

3. A statement of the purity of the seed contained, specifying the kind and percentage of impurities.

4. Locality where seed was grown and when grown.

Time spent by the farmer in examination of these statements on seed packages will be well spent, and may prevent his making a mistake in the selection of his seed. The farmer should bear in mind the fact that these statements cannot always be relied upon, and where he has any reason to believe that a seed is not all that it is claimed for it, he should secure a sample of that seed and have it tested before he buys.

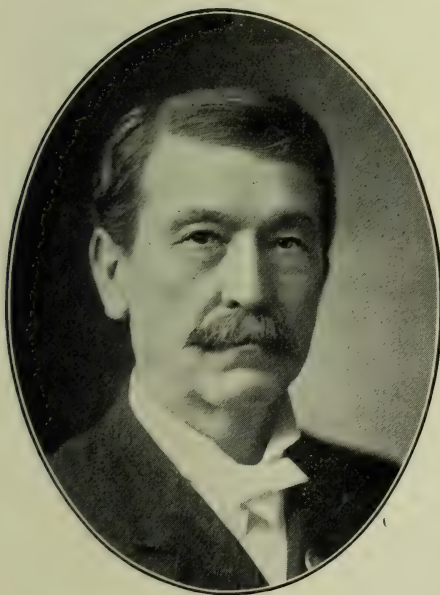
The Department of Agriculture now maintains a well-equipped laboratory for making tests of this kind, and any samples of seed sent in by the farmers of the State will be examined and reported upon free of any charge.

Col. Robert Gates, of the Industrial Department of the Louisville & Nashville Railroad, was on the program for an address. On account of feeble health he was unable to be present, but sent his paper, which was read to the convention by Mr. A. L. Garrison. Col. Gates' paper was as follows:

RELATIONSHIP BETWEEN AGRICULTURE AND TRANSPORTATION.

BY COL. ROBERT GATES.

Gentlemen of the Middle Tennessee Farmers' Institute:



A relationship even more sensitive than that between capital and labor, as they are economically united, is the relationship between agriculture and transportation. As capital and labor are mutually dependent, so are agriculture and transportation bound and interlocked as to render it physically impossible to injure one without doing injury to the other. The abstract question as to which is the stronger does not concern us for the reason that in a natural and congenial union of things, as of individuals, that consideration is immaterial because the very nature of the alliance precludes even a generous rivalry as to the distribution of strength. Suffice it to say that agriculture and transportation as natural allies are the most potent material forces in the ad-

vancement and the maintenance of civilization.

There can be no necessary conflict between agriculture and transportation,

and whosoever seeks to array one against the other attempts to disturb a relationship whose harmony has resounded through the ages bearing a message of dual achievement and a promise of even greater fulfillment in the future.

No two material forces in our economic life are more potential in union than agriculture, standing for production, and transportation, standing for distribution.

The first peaceful occupation of civilized man was agriculture. With agriculture came fixed habitations; and with the rights of property, the means of protection. The social conditions of husbandry gave birth to communities, and from the establishment and growth of communities commerce received its first mighty and world-covering impetus.

Agriculture—soil production—and transportation, or distribution, originate and distribute not only the prime necessities of life, but they are the indispensable instrumentalities for the advancement of civilization.

It is an economic verity that trade involves distribution as well as production. Obviously production is dependent upon transportation for distribution. Why, the areas of cultivation would be woefully limited but for facilities of transportation. There is not a farmer in this audience who does not know and appreciate that but for the railroads he would have to be easily accessible to water transportation in order to conveniently market his products. Transportation makes unlimited the areas of cultivation, and unquestionably the unexcelled facilities afforded by the railroads of this country make it the garden spot of the habitable part of the globe.

The vital relation that transportation bears to production was distressingly illustrated in the first few weeks of the calamitous war in Europe. There was suddenly withdrawn from ocean service a number of great ships of commerce belonging to one or the other of the foreign countries involved in this unhappy conflict. The effect upon commerce in this country was immediately depressing. The Congress of the United States, realizing the gravity of the situation thus unexpectedly precipitated, lost no time in enacting a law admitting foreign-built ships to American registry. Why was such a law enacted? Because our lawmakers realized the great danger that threatened our commerce because of the serious crippling of one of the great mediums of transportation.

A United States Senator of renown, speaking in the Senate a few days ago, observed that "means of transportation and communication aid the nation and advance civilization." Was he right or was he wrong? I shall not pause for an answer, because this is an intelligent and a progressive gathering of men who think as well as toil.

When the Congress of the United States enacted the law admitting foreign-built ships to American registry—which permits them to fly the American flag—it not only recognized the importance of maintaining adequate carrying facilities of commerce, but it gave unmistakable assurance of its recognition of the fact that one party to the alliance between agriculture—or commerce—and transportation could not be seriously impaired without injury to the other. Undoubtedly what hurts one affects the other—so closely are their mutual interests interwoven.

Diminished production is felt by common carriers as the great agricultural interest is helped or hurt in times of plethoric production by the facilities or lack of facilities on the part of the carriers to keep in communication with the great market centers.

A fact not generally known among laymen is that the railroads themselves are the largest employers of labor as well as the largest purchasers of supplies—with special reference to supplies originating on the farm. Cripple or otherwise impair the purchasing power of the railroads and naturally and inevitably the effect is felt adversely at the sources of supply.

I cannot allow this occasion to pass without reminding this gathering of patriotic citizens and representative farmers of the good feeling that now subsists between the people of Tennessee and the railroads. This feeling of mutual trust and better understanding is probably known to each of you. Your welfare, your prosperity, your increase of farm production, your happiness and contentment are matters in which the men who control and operate the railroads of Tennessee are concerned. If they were not so concerned they would be not only lacking in the essentials of humanity, but they would be fools beyond the hope of instruction. Your interest is vital to them; it is linked with their interest; without your production they would be without an occupation, and without their facilities of transportation your production would soon have no market value.

The far-seeing, level-headed, clear-thinking men who maintain our great transportation interests are not going to favor a policy or pursue a course that would deplete your energies or reduce your producing capacity. The railroads do best, prosper most when they have commerce to transport, and the bulk of the commerce that keeps their trains moving originates in the soil. On the other hand, the carriers cannot be harassed or hampered by needless or thoughtless legislation without serious detriment to their efficiency of public service. They should not be pursued because their pursuers find a sort of grim pleasure in the pursuit. Regulation should go no farther than requiring the railroads to render fair and equal service for fair and equal pay. But unfortunately it long ago exceeded that limitation. Regulation has gone from radicalism until it now verges on the edge of ruin. About all that a railroad may do nowadays without arbitrary dictation or bureau molestation is to spend its earnings in improvements and betterments. This privilege is still intact.

Fortunately, and I say it with swelling pride and pleasure, there is no "railroad issue" in Tennessee as the average discerning citizen understands the meaning of the word "issue." The railroads of Tennessee employ in their numerous departments of service many thousands of men who are among the most patriotic, home-loving, industrious and intelligent to be found in the State. To say that the great farming class is not on terms of peace and friendship with the railroads is to charge that the farmers are arrayed in hatred and hostility against the men who work in the railroad shops and operate the countless trains that daily and nightly transport thousands of human beings and thousands of tons of freight. Tennessee will advance in the development of its varied resources and enterprises if given anything like a fair chance, and the railroads will do their part in the progressive movement.

Let common sense and mutual good feeling prevail and all will be well for the people of Tennessee and every legitimate industry in the State.

By way of information and suggestion, I call your attention to three important measures that will come before this Legislature which should command your serious consideration:

First, the enlargement of the powers of the Railroad Commission, which already has more power than is good for the railroads or the public.

Second, the bill authorizing large expenditures to be borne solely by the railroads while other corporations are equally or more interested.

Third, a fellow servants' or workmen's compensation act, which will demand more thoughtful consideration in order to avoid discrimination or crippling industries.

If these measures are enacted on radical lines they will greatly and seriously embarrass the railroads and further burden them with taxation which will affect the public more or less, both directly and indirectly.

"Cooperative Marketing" was the subject of a very timely and interesting address by Mr. L. M. Rhodes, President of the Tennessee Division of the Farmers' Educational and Cooperative Union of America. Mr. Rhodes' address follows:

COOPERATIVE MARKETING.

BY L. M. RHODES, STATE PRESIDENT FARMERS' UNION.

Mr. President and Gentlemen: I am always glad to have an opportunity to talk to the farmers of Middle Tennessee, and especially when I can talk to them about marketing their crops—"buying and selling." We can never rise above the crudities of barbarism unless we produce a surplus. And we can never escape poverty and want unless we learn how to market that surplus.

The farmers of the United States are a failure in business, and will be as long as they sell at wholesale and buy at retail. The average farmer seldom realizes how closely he is connected with the markets. From the time he is born in the world and wrapped in swaddling clothes until he embarks for eternity in a cotton shroud he is constantly buying or selling something. Yet since the morning of time he has had less to say about the price and weight of the things he has bought and sold than the members of any other vocation. Others price and weigh his produce. Others weigh and price what he buys. He has been going like a lamb to the shearers and opening not his mouth.

During this convention, and most all other farmers' meetings, production alone has been discussed. I heartily approve of every effort towards greater production and better farming, but increased production alone will never make the farmers prosperous. If it would they would now be rolling in wealth, for we have produced in the last twenty-two years \$145,000,000,000 worth of products, enough to buy all the property in the United States and build a concrete fence around it. But even with this enormous production the farmers are not holding their own, for a score of years ago they owned one-fourth of the wealth, and now they own less than one-fifth.

In 1860 there were 31,000,000 of people in the United States. Now there are nearly 100,000,000. Then the per capita wealth was \$516. Now it is \$1,400. But at that time there were \$16,000,000,000 worth of wealth in this country and the farmers owned \$8,000,000,000, or 50 per cent. Now there is \$140,000,000,000 worth of wealth in this country and the farmers own \$27,000,000,000, or a little

less than 20 per cent. There is \$41,000,000,000 worth of farm property in the United States, but \$14,000,000,000 of it belongs to people who do not farm. Nearly 35 per cent of the farm property belongs to corporations, foreigners and rich individuals who are not farmers and do not till the soil. No wonder tenantry is increasing faster than home ownership and that mortgages on farms have increased in 24 years from 3 to 17 per cent, for \$50,000,000,000 of the \$145,000,000,000 produced in the last 22 years has gone into the waste basket of distribution and sink hole of speculation. There are too many toll gates between the farm and the table; the road is too long from the field to the factory. The average value of farm products for the last four years has been about \$9,000,000,000. Of this \$6,000,000,000 worth has been sold (farm prices) each year and the consumers have paid an average of \$13,000,000,000 for what the farmers received \$6,000,000,000.

Now we want to be perfectly fair to everybody that should be connected with distribution or marketing of crops and make what seems to be a fair division of the \$13,000,000,000. In 1913 the retailers got for handling agricultural products \$900,000,000. We will count out for them \$1,500,000,000; the wholesalers received \$750,000,000. We will count out for them \$1,000,000,000. The transportation companies received \$445,000,000; for their services we will give them \$1,000,000,000, and then throw in \$500,000,000 for all possible misallowances, and we will, after abundantly providing for each and every legitimate expense, have \$9,000,000,000 left for the farmer instead of \$6,000,000,000, or a gain of 50 per cent.

The \$3,000,000,000 gain for the farmer will double his net income or increase his gross income 50 per cent. It will pay all farm indebtedness in two years or pay all mortgages in one year.

The farmers of the United States have lost enough by poor methods of marketing in a score of years to buy all the tenant land in the United States, build a nice home on every farm in the United States, pay all farm indebtedness, and educate every farm boy and girl in this country, and it is folly to continue this loss and waste.

The problem of the farmers is to increase the income of the farm. The average farm in the United States with its equipment is valued at \$6,444. The average net income of the farm has never been shown by any census report to be as much as \$500 per annum, so our farms are only paying $7\frac{3}{4}$ per cent on the investment, and to get this the farmers must put in about 4,000,000,000 days' work per annum.

So they are working for nothing or furnishing the world the use of their property for nothing. There are 30,000,000 of people living on the farms of this country. Multiply this number by $365\frac{1}{4}$ days and it will give 10,957,500,000 days living to be provided for with a gross income of \$6,000,000,000, or 54 cents a day. This meager income can be greatly increased by cooperative marketing.

Cooperative banking in Germany has reached the enormous annual turnover of \$6,000,000,000. Cooperative merchandising and industrial business in England has reached \$555,000,000, operating under one system, the wholesale department aggregating \$150,000,000 a year. Cooperative banking and purchasing in France runs into the hundreds of millions annually. Cooperation is so extensive in Denmark that on the average every farmer at the head of a family is a member of four cooperative associations.

And this country is beginning to step into the procession. The grain growers of this country have over \$20,000,000 invested in grain elevators, and handle about \$300,000,000 worth of grain per annum. There are 6,300 creameries. Millions have been invested in cotton warehouses, tobacco warehouses, milling plants, and cooperative stores. Live stock and poultry associations have been organized. To make a long story short, the Farmers' Union has several thousand business enterprises in the United States, many of them in Tennessee, and they are saving several hundred thousand dollars per annum to the farmers of the State.

Any county or community of farmers can get full instructions how to become members of the union, how to organize cooperative selling associations, etc., by writing to C. W. Brooks, Atwood, Tenn.

And we must eliminate the waste, loss and graft in marketing by organization, cooperation and business intelligence, or take results; for it is as much a part of farming to market properly as to produce abundantly, and it is folly to husband from the soil, sunshine and showers a crop that will supply the world and then auction off below the cost of production, or at an unprofitable price.

Then, farmers, let's get together, produce enough, sell it properly, buy together, cut out the waste, and usher in a brighter day for the farmer and an era of prosperity for the tillers of the soil.

J. A. Dinwiddie, Assistant Commissioner of Agriculture for East Tennessee, addressed the convention. Mr. Dinwiddie is one of the best poultry men in the State and his address was listened to with a great deal of interest by the delegates. His address follows:

OPPORTUNITIES FOR PROFIT IN THE POULTRY INDUSTRY.

BY J. A. DINWIDDIE.

Ninety farms out of every 100 in Tennessee raise poultry. We cannot go to any farm, scarcely, unless we find thereon chickens, as some are pleased to call them. At least seventy-five per cent of these farms keep and raise these birds at a great loss. This may be attributed to three reasons, namely: mongrel stock, unnatural environments, improper feed.

By mongrel stock, we mean scrubs. We often find on farms a Plymouth Rock, Leghorn, Rhode Island Red, and others none can tell just what breed they are. All are running together, and with them are cockerels of as many and as mixed breeds as are the flock. Farmers must learn that they must get one good breed of chickens and keep only that breed together. With these should be well marked males of the same type, and these should not be allowed to run with other poultry. It is true there are lots of pure bred chickens taken to farms annually, but these are allowed to run loose with mongrels, and soon the pure breeds are not distinguishable from the mongrels—in fact, there is no pure breed.

In the second place, chickens must be kept in nice, clean pens if they are paying birds. The houses should be well ventilated, walls should be well white-

washed, the roosting poles should be well saturated with oil or some kind of material to keep out lice, and clean straw should be kept scattered on the floor.

The yard should also be kept in a sanitary condition, and chickens not allowed to run in damp, sloppy places. Each bird should have as much as four feet of floor space in which to scratch during the winter or rainy days. Green feed should be given them scattered in the straw. Plenty of green grass should also be fed the chickens. On a well sodded acre of land, 500 birds can be taken care of in excellent condition.

In the third place, very best feed must be given chickens to make them productive. They must not be underfed nor overfed. The limit to a well fed hen is four ounces of feed per day. This should be well balanced. Feeds should consist of whole grain and plenty of ground grain, plenty of meat and fresh water. Chickens need grasshoppers, worms, etc., to get protein, and if this is not supplied them, then meat scraps and green bone should be fed to them. Corn, wheat, oats, soy beans and peas have fats, but not in sufficient quantities nor in proper proportions for hens to produce the best eggs. A good recipe for daily rations for 100 chickens is: six pounds cracked corn, ten pounds good whole wheat. This should be mixed and fed on scratching floors, six pounds in the morning and ten pounds at night; within the feeding hoppers: three pounds corn meal, three pounds wheat bran, four pounds beef scraps; also plenty of fresh water, grit, oyster shell and green pasture a few hours each day.

If one has not good pasture, then this should be supplied with shredded alfalfa meal mixed with ground feed.

By intelligent management of a farm, one can make poultry pay. I have been in the poultry business sixteen years, and unless we care for our chickens as we do our horses, cows, hogs and sheep, we cannot expect to get results. If we let chickens run loose in the winter, and find shelter under sheds, and tramp around in barnyards that are not kept clean, or in other unnatural environments, our chickens will never pay us.

If we have good stock, however, and can afford the poultry natural environments, with proper feed, we can make money.

At the conclusion of Mr. Dinwiddie's address the convention adjourned until 1:30 o'clock in the afternoon.

AFTERNOON SESSION.

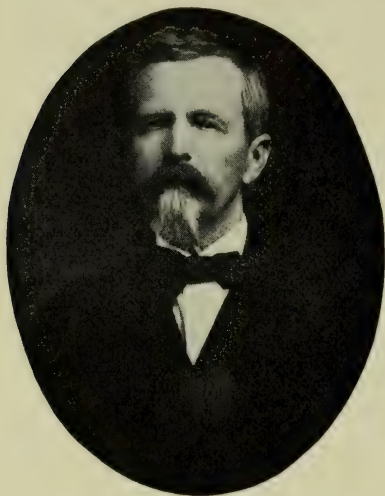
At 1:30 o'clock the convention was called to order by President Gallagher, with a good attendance of delegates.

Col. Jesse Tomlinson, Commissioner of Agriculture for Middle Tennessee, addressed the convention on "The Use of Commercial Fertilizers."

Col. Tomlinson's address follows:

COMMUNITY COOPERATION.

BY JESSE TOMLINSON.

Mr. Chairman and Gentlemen of the Institute.

The subject assigned me for this occasion is Commercial Fertilizers, but as this has been so often and thoroughly treated of late in our agricultural meetings, I believe it will be more interesting to discuss for the few minutes given me Community Cooperation.

The efforts to organize rural communities into units are recent in Tennessee, and have not been as effective as its importance merits. Country people are slow to realize that the development of the particular community in which they live is more important to them than the development of any other locality. They fail to grasp the fact that a thing that benefits the community redounds to the good of each member

of that community. They fail to realize that it is the duty of every good citizen to make an effort for the bettering of the surroundings of his neighbors.

In short, the average countryman is not public-spirited. These conditions make the work of the promoter or organizer of the rural cooperative clubs slow and unsatisfactory. And yet, there are no other means through which the average country community can be aroused to even desire better surroundings. But when a community is vitalized by the organization of a live club, then it is that it becomes capable of solving almost any problem that may arise locally. I believe that the combined judgment of almost any Tennessee neighborhood is likely to be more correct on a practical local question than that of the most skilled expert—whether the subject be concerning use of fertilizer, rotation of crops or what not. In a live and properly conducted club it is easy to get the consensus of opinion on any subject pertaining to the welfare of the community.

Having devoted some time to the study and organization of such clubs, I am convinced that if country life in Tennessee ever attains the standard of refinement, intelligence and public-spiritedness that is desirable, it will have to come through and by such community efforts.

The road, church, school, or society in any locality will never be best until the live wires of that locality act concertedly. Nor will any community ever become progressive until some individual or organization takes the lead.

The organization of these local clubs is a convenient way of stimulating the enterprising citizens of that community to action. The difficulty of awakening the people of Tennessee to the importance of this work is great, but the benefits to the State will be greater.

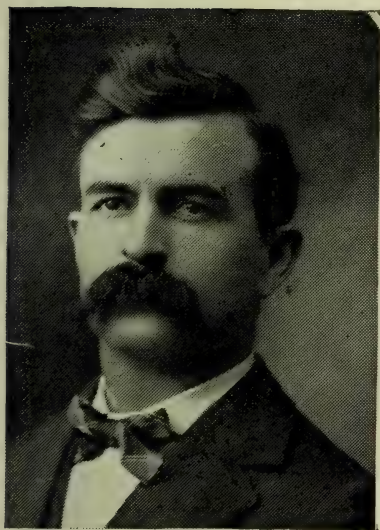
Therefore it behooves each member of this Institute, when he returns to his home, to use his best efforts to encourage such an organization in his immediate

neighborhood, and if each member of this Institute would pursue such a course I dare say that more will be done for the uplift of rural life in Tennessee in the next year than has been done in the last decade.

Prof. Kary C. Davis, of the Seaman A. Knapp School of Country Life, George Peabody College, addressed the convention. Prof. Davis' address follows:

DOUBLING THE CORN CROP.

BY DR. K. C. DAVIS.



We should not have to double the corn crop by doubling the area next year. We should rather increase the yield on the present area by better methods.

The fall season is a suitable time to begin the plan for next year's crop. This is the time to select the seed corn. Go out in the field before harvesting the crop and pick out the ears that are the best for seed, rather than buy the seed from other localities. By all means never buy seed corn that has been shelled. We cannot judge corn that has been shelled. We must know the size of the cob, and how closely the corn is packed upon the cob, before we can get a very good idea of its yielding powers.

In selecting seed corn in field now, let us take the ears that are of good size, well covered with husks, those

that have small stems, so that they hang over and are not affected by the weather; those that are well matured, and those that have kernels tight upon the cob. A good plan would be to follow the boys' corn club score cards and pick the best corn possible. This will improve next year's crop. Select several times as much corn as will probably be used for seed, then in midwinter it can be sorted over and tested for germination. Only the best should be saved. It pays to test the germination of seed corn, as it often saves the work of replanting the field.

If a corn field is to be plowed in the fall, it should be sown with a mixture of one bushel of rye, one peck of winter vetch, and seven pounds of crimson clover per acre. The earlier this is done the better. In very early springtime turn this green growth under or disk it in.

After the earliest spring tillage of the field let the ground be kept loose by the use of a spike-tooth harrow about once a week until corn planting time. This continuous harrowing is beneficial to the soil and the future

crop in many ways: (1) It saves the moisture for the crop to use later when dry weather sets in; (2) It prevents the ground from becoming puddled by heavy rains, and the water will penetrate to greater depths; (3) It warms the soil by letting in warm air, and corn requires a warm soil to properly germinate; (4) It germinates many weed seeds and kills the sprouts by breaking them off, thus the field is kept free from weeds nearly all summer; (5) It multiplies beneficial soil bacteria and unlocks plant food for the corn crop to use.

When corn is planted the harrow should be run over the soil again, and the harrowing may continue once a week after the corn is up, until the growth is so high as to be broken by the crossbars of the harrow. This will save much of the row-by-row plowing or cultivating. In the future tillage of the crop with a horse cultivator the principal points to be remembered are: (1) Never allow the surface of the soil to become crusted; (2) Never allow the shovels or teeth to go very deep, as roots would thus be injured; (3) Keep the tillage going until the corn is so big or leans over so much that the horses cannot go through the field.

The methods here outlined do not require more work than many bad methods which we sometimes find in use. In fact, shallow tillage is easier than deep tillage and does more good. Harrowing with a wide, pegged-tooth harrow and two horses is more valuable and is cheaper than using a one-horse plow.

Some may criticize these methods, saying that deep tillage is sometimes necessary. This point of view comes from the fact that the ground is sometimes allowed to become puddled or baked and is so hard that deep tillage is required to again restore the fine condition of the soil. The fault lies in allowing the top to become packed and hard. Shallow and frequent tillage will prevent this.

Farmers who practice the above methods are strong in advocating them. They are well tried and nothing is visionary or impractical about them. All we ask is that all corn growers will make a thorough and impartial trial before objecting to them.

Mr. B. B. Miller, of Dickson County, made a short talk to the convention. Mr. Miller's address dealt with the reclamation of worn-out land, and was enjoyed by the convention.

Dr. Olin West, of the Tennessee State Board of Health, addressed the convention on "Rural Sanitation." Dr. West's address follows:

SOIL-BORNE AND WATER-BORNE DISEASES.

BY DR. OLIN WEST.

Members of the Middle Tennessee Farmers' Convention.

I am very sure that every person in this intelligent audience is keenly aware of the fact that the material welfare of any individual is dependent in a peculiar way upon his health, this being especially true of the farmer. The subject of health preservation is a large one and only a small part of the entire subject can be advantageously discussed in the time at my disposal. For that reason I desire to make an effort to impress upon your minds just two things this afternoon.

First, that certain disabling and certain fatal diseases most prevalent in the country are water-borne or soil-borne; second, that the disease spread through these avenues is very largely preventable.

The State Board of Health of Tennessee an certain cooperating agencies have been conducting a campaign for better sanitation in the rural districts of the State for nearly five years. A great deal has been accomplished, but when we take into consideration the conditions which existed when this campaign was started and review the accomplishment, it is evident that the fight has just begun.

By bringing to the attention of intelligent country dwellers, such as are congregated here today, the information which we have been trying to disseminate, we feel that we have a right to expect that intelligent and active cooperation will be secured which will count for a great deal in bringing about further improvement in the insanitary conditions which obtain in the rural districts of the State, and hence in the prevention of the diseases that are spread almost entirely because of these insanitary conditions.

The most important of the diseases that are soil and water borne are typhoid fever, hookworm disease, and diarrhoeas and dysenteries. These diseases have each their specific causes, typhoid fever being caused by a micro-organism which chooses the bowel as its site of residence in the human body. Hookworm disease is caused by a worm which develops to maturity in the bowel of its victim, and the dysenteries are also produced by little organisms which take up their abode in the bowel. The various agents which cause these diseases are vigorous and resistant to the conditions which will easily bring about the death of many other disease-producing organisms. For instance, the germ of typhoid fever may be frozen in ice and yet will revive and be capable of producing the disease in a healthy person.

The germs of typhoid fever and dysentery and the eggs of the hookworm are passed out with the natural discharges from the bodies of those who have

these diseases. If these discharges are carelessly thrown out on the ground or deposited in an ordinary open surface closet the germs contained in them retain their vitality for various lengths of time. They may be carried into wells or springs by surface drainage or by seepage through the soil; they may be carried by flies or other insects and deposited upon food. By drinking this contaminated water or by drinking milk kept in vessels which have been washed with the poisoned water, persons become infected and succumb to disease; by eating contaminated food upon which flies or other insects have placed disease germs brought from insanitary closets or other places, persons contract typhoid fever and dysentery, and may contract hookworm disease in this way, too. The truth of these statements relative to the transmission of these diseases is well established. I am not asking you to accept any fanciful theory.

The second thing I want to impress upon you is that these diseases about which we have been talking and which are very prevalent in the country in Tennessee, are largely preventable. Since they are most largely spread as a result of soil pollution, the contamination of the soil with disease germs from the bodies of those who are sick, it is at once evident that if we can stop soil pollution we can prevent, to a large degree, the occurrence of these diseases in our homes. The simple expedient of a sanitary closet, the use of which is enforced, in every rural home and school, together with the proper disposal of the discharges of those sick with typhoid and hookworm disease and dysentery, will reduce the tremendous prevalence of these diseases to a marked extent, saving life, preventing human disability, and mitigating poverty. Sewers, if you can have them, well made septic tanks if you cannot have sewers, and inexpensive sanitary closets if you can do no better, will make for health. The State Board of Health will furnish you further information for the asking.

This is all I have to say to you, except for one final statement that I hope will be impressive. You do not "catch" typhoid fever. You eat it and drink it, taking into your body the germ that some other person had before you. When your boy or girl gets hookworm disease it is because you have permitted them to be exposed to infection which passed along to them from someone else, and which is made possible because of lack of attention to sanitary precaution which decency should demand and which can be easily taken.

"Health is wealth," and is gettable by the expenditure of comparatively little effort and money.

At the conclusion of Dr. West's address the convention adjourned until 7:30 p. m.

NIGHT SESSION.

The convention was called to order at 7:30 by Col. Jesse Tomlinson, who presided in the absence of President Gallagher.

Prof. C. A. Willson, of the College of Agriculture, University of Tennessee, Knoxville, addressed the convention on "Cattle Feeding." His address follows:

CATTLE FEEDING.

By C. A. WILLSON, UNIVERSITY OF TENNESSEE.

The subject assigned me on the program is a very broad one and may be treated in various ways. We presume that it has been so worded as to permit the speaker to take any phase of the question that he may deem most important. It seems to me that the problem before this audience is not so much "how to feed cattle" as "whether or not it will be profitable to feed cattle." (A vote of the audience showed that less than five per cent of those present could be classed as cattle feeders.) The problem then that is before me as a speaker to you today is not to "tell you how to feed cattle" but in some way to interest you in the raising of cattle.

At one time Tennessee ranked well with other States in the production of beef cattle, but when the vast areas of the western ranges were opened up after the Civil War and beef became low in price because of the low cost of production on the western ranges, and also because of the overproduction of beef, then Tennessee went out of the beef producing business. We got out of the habit of producing beef cattle, and now do not find it convenient to return because we have not the equipment on hand for producing beef cattle. We have not cows, fences, nor grass. The most important of these is grass.

There are thousands of acres in this State that should be put into grass and then be grazed by cattle. Thousands of acres of hillsides that now are bare and gullied should be covered with grass so as to prevent soil erosion, and if grazed would bring a return instead of being a total loss. Thousands of acres of hills instead of being tilled should be grazed, for the cost of labor required to produce crops upon them is often greater than the value of the crop produced.

Thousands of acres of waste land that are now a total loss from an economic point of view could be utilized by cattle. Live stock would utilize waste land and waste products of the farm. Millions of dollars worth of feed goes to waste on Tennessee farms every year that could be utilized by cattle and other kinds of live stock.

The chief advantage that would result from the keeping of live stock would be that to a large extent, on the majority of farms, the returns from the keeping of live stock would result in additional returns to each farm. These returns would be additional returns because of the fact that live stock would turn into money the roughages of the farms that are now going to waste. More than one-half the corn fodder of this State goes to waste every year. For every head of cattle in this State there is produced three acres of corn, which will average one ton of stover per acre. One and one-half tons of stover is more than is needed to winter one head of cattle. There is going to waste, then, every year in this State 5,700,000 tons of corn stover, which at a valuation of \$5.00 per ton means a loss to the farmers of this State, through a lack of proper utilization by cattle, of over \$28,000,000.

Beef cattle would conserve the fertility of our farms and increase our average crop production. Writers often point out to us the great wonders that have been accomplished in increased crop production in the Old World countries through the utilization of crops and feeds by cattle and the return of the manure to their farms, and have held up to us Denmark, Germany, and other countries as marked examples of what such methods would do for our crop yields.

It has occurred to me that if we could find similar illustrations of what has been accomplished in our own country that the lesson would be more forceful. With that end in view it has occurred to me that we might compare the agriculture of this State with that of Wisconsin. In the year 1880 we find that the average cereal production of this State was 16.3 bushels, and for Wisconsin was 23.0 bushels. We should expect that for Wisconsin it would be a little higher at that time, for then Wisconsin was a new State, and this State was even then becoming an old State. The average acreage of cereals was practically the same for each State. The number of horses, cattle, sheep, and hogs was also practically the same for each State. In 1910 we find that the average cereal production for each State is as follows: For Tennessee 19.1 bushels, for Wisconsin 30.4 bushels per acre. Through better methods of agriculture Tennessee had increased her production per acre by less than three bushels, while Wisconsin had increased hers by more than seven bushels.

A review of the live stock statistics for the year shows that the number of horses, sheep, and hogs is still practically the same for each State, but Wisconsin has 1,683,545 more cattle than has Tennessee. There is not much wonder then that Wisconsin during the past thirty years has increased her production per acre by 7.4 bushels, while Tennessee has only increased hers by 2.8 bushels, for Wisconsin has been putting back on her farms \$50,000,000 worth more of manure each year than has Tennessee. We have been selling out cottonseed meal and corn, and Wisconsin has been adding the fertility from them to her soil. Wisconsin keeps live stock. We keep practically none. The average number of cattle per farm in Wisconsin is 8.3. The average number of cattle per farm in Tennessee is 1.7. Wisconsin farmers are keeping five times as many cattle per farm as are the farmers of Tennessee, and are producing fifty-eight per cent larger crops per acre. The increased production per acre on Wisconsin farms during the past thirty years has been 2.6 times as great as it has been for this State. If we are to increase the average production per acre of cereals we must follow after the methods of other countries and communities which have increased their crop production. We must do so through the use of live stock.

The production of beef cattle by farmers of this State can be made more profitable than has ever been possible heretofore, owing to the high prices of beef today. When beef cattle were selling at \$3.50 in the nineties a thousand-pound steer brought \$35.00. Today the same steer sells for \$70.00. It takes no more feed to produce that steer than it did in the nineties, and the profit is very much greater than it was at that time. There is from \$15.00 to \$20.00 more profit that may be made per steer today than there was fifteen years ago. It has taken the farmers of this State about that length of time to get out of the cattle business. The beef cattle business is more profitable today than it has been for many years.

Farmers who keep beef cattle make more money than do farmers who depend upon grain crops entirely for the farm returns. In a recent investigation made by the Office of Farm Management, Department of Agriculture, on live stock and grain farms of Iowa, Illinois, and Indiana, it was found that the average labor income of owners who managed their farms as live stock farms was \$755, while the average labor income of owners who managed their farms as grain farms was \$28. Tenants who made live stock their principal source of income had a labor income of \$717, while tenants who made crops their principal

source of income made a labor income of only \$327. The reasons why the live stock farmers made larger incomes was because they utilized all the rough feed on their farms and obtained a return from feeds that otherwise would have been wasted, and also because they were able through the use of live stock to utilize their labor to a better advantage. The live stock farmers were also, through the use of live stock, able to sell their grain crops at a higher price.

The type of live stock farming that shall be followed by farmers of various States will depend upon the local conditions of that State. We in this State cannot follow the methods that work best for the farmers of Iowa, because of the fact that our feeds may be somewhat different, and also because our feeds are worth more per bushel. Farmers are quite right in the assertion that they cannot afford to feed 90 cent corn to beef cattle. Many ask the question, "If we cannot feed corn to advantage, then what type of beef cattle production can we best follow?" It seems to me that this State, and the South generally, should be a feeder cattle producing section just as the Western ranges have been in the past.

Corn averages ninety cents to a dollar per bushel and hay often sells at fifteen to twenty dollars per ton, and these are the feeds that are most used by the large feeders of the corn belt. On the other hand, we can grow grass in abundance and can grow it nearly through the entire year. We can also grow a great variety of forages. Corn is one of our principal crops, and there are every year thousands of acres of the stover that is almost entirely wasted that could be utilized by stocker cattle. Alabama experiments show that a 1,000-pound steer can be produced under Southern conditions at a cost of four cents per pound; and today a 1,000-pound feeder steer will bring on the market seven cents per pound. On that basis, then, we could make on every feeder steer produced a \$40 profit. On every farm we have going to waste rough feed that could be profitably used for the production of feeder cattle. The average farm of this State is eighty-one acres in size, and should produce four or five feeder cattle each year. This number could be raised on the average farm without diminishing the average crop returns of the farm, and the live stock returns would be added profit.

Cattle can be successfully fed in this State and with feeds other than those used in the Northern States. The Tennessee Experiment Station has shown at the West Tennessee station that cattle can be successfully fed on cottonseed meal and silage. Cottonseed meal is produced abundantly in the South, and silage can be produced more successfully than in the North. The most successful gains and finish have been put on through the use of medium amounts of meal, such as five to seven pounds per head per day, a small amount of rough feed, such as oat straw or cheap hay, and forty pounds of silage per head per day. A medium finish can be put on at a low cost.

The average cost per pound gain with the lots that received silage and cottonseed meal at the rate of three, four and five pounds per day was 8.53 cents; with lots receiving a medium amount of cottonseed meal of five to seven pounds, 8.52 cents, and with lots receiving a high cottonseed meal ration of seven to nine pounds, 12.09 cents. The general results from the work on cottonseed meal feeding indicated that the best and cheapest gains were made when the amount of cottonseed meal fed gradually increased from five to seven pounds per head per day throughout the feeding period. Under such conditions

the gains produced cost practically the same as their selling value, thus showing that the Southern feeder can feed on a much narrower margin than can the Northern feeder, who uses more grain to put on a finish.

From the experiments conducted by the Tennessee Experiment Station it was shown that silage would sell at a good price when used for finishing steers. A farm value was figured for silage by figuring on a basis that the steers would sell at seven cents and that they were fed on a \$1.50 margin. On this basis the value obtained for corn silage was \$7.65 per ton. Neither was this the only source of profit from the feeding of steers at the West Tennessee Experiment Station. When the experiment farm was turned over to the State for experimental purposes the amount of cotton that each acre would produce was less than one bale per acre, and now it is more than two bales per acre, and that in the short space of time of six years. It has come about in this way: During the steer feeding experiments carried on there, there has been fed 28.6 tons of cottonseed meal, which returned to the soil, after passing through the steers, not less than \$629 worth of fertilizing constituents. The manure from the silage portion of the ration fed must have been not less than \$354. The total value of the manure returned to the soil was, then, not less than \$983, and that in addition to the fact that \$7.65 was obtained for every ton of silage fed.

There is no question then but that the feeding of steers by farmers of this State would be the means of increasing the soil fertility so as to produce more crops per acre. This means that the income of each farmer would be greater, and the farmer become more prosperous.

Prof. W. K. Tate, of the George Peabody College for Teachers, addressed the convention. His address follows:

SOME ELEMENTS IN THE COUNTRY SCHOOL OF THE FUTURE.

BY W. K. TATE, PROFESSOR OF RURAL EDUCATION, GEORGE PEABODY COLLEGE FOR TEACHERS.

One of the most evident facts which has come to my attention during the years in which I have been engaged in country school work, is the fact that agricultural prosperity alone does not bring happiness and contentment to the farmer. During recent years the prices which the farmer has received for his products have been more satisfactory than ever before in the history of the United States. In spite of the improved methods of farming and the better living conditions which come with these, the movement from the country to the town will continue until the educational and social conditions of the country are such as will be permanently satisfying to an intelligent and cultured man and his family.

It has been my observation for the past four years, as Rural School Supervisor in a sister State, that a good cotton crop and good prices are usually followed by an increase in the number of removals from country to town. As long as the farmer remains poor he must stay in the country. With prosperity comes the desire for better educational and social advantages for his children, and he usually finds it easier to get these in town than to develop them in the country.

I am pleased to note that your program at the Farmers' Institute has included a number of subjects which have to deal with the social and educational side of the country life problems. We are now in a period of transition in America. In pioneer times the farmer was expected to wear out one field and move to another. Under pioneer conditions the church and the school were temporary institutions along with the farm. It was not reasonable to expect a farmer to build a school house or a church which was more permanent than his own probable period of abode in a certain community. The westward wave, however, has now been turned back by the ocean, and American country life is becoming gradually more settled and permanent. Scientific agriculture is teaching the farmer how to renew the field, worn out by wasteful tillage. The agricultural expert has left the academic shades of the college and experiment station and upon the field of the farmer is showing how to apply scientific principles to agriculture. State and nation are beginning to unite their forces to improve the methods of farm operation and of marketing the crops so that the farmer himself may have a greater share in the fruits of his labor.

With this greater stability has come the realization that the school, the church and the community social life must also be made more stable if life in the country is to be permanently satisfying. It is a matter of common knowledge that the community which supports a good school and a good church and maintains a satisfactory social life will also hold its young men and its young women and will increase in population and prosperity, while the community which allows its school and its church to deteriorate rapidly becomes a region filled with tenants whose agricultural methods are unproductive and whose community life is unsatisfactory. The problem of building a permanent school, and of making this school and church by its side, the community social center, is one of the great tasks before you.

The first element in this task is to secure greater stability in the administration of the country school. In the city the Superintendent of Education has been elected by a stable Board of Trustees and has held his office usually for a term of years. He has thus been enabled to formulate a definite program of progress. Almost to the present time, however, we have left the administration of the country school to the contingencies of politics. In my opinion a successful rural school system demands that the State Superintendent of Education be elected by a State Board of Education whose terms of office do not all expire at the same time. He must be elected for a term of years without reference to political party or faction, but solely on account of his ability to administer the state system of public schools. The present instability bears most heavily on the country school, since most of the cities have, through special legislation, largely eliminated themselves from the direct influence of the State Superintendent.

In a like manner the County Superintendent of Education should be an officer selected by a stable board on account of his fitness to supervise the schools of his county. The City Board of Trustees at present is able to go anywhere in the world in their search for the best man to superintend the city system. The County Board of Education should be equally free.

The County Superintendent of Education should have ample assistance in supervising the schools. There should be a supervisor of agricultural work for boys, and a director of canning clubs and home activities for the girls. There

should be one or more special assistants who would have charge of the training of the inexperienced teachers through close supervision of their work.

At present the country school itself is in most cases absolutely without stability or continuity in its teaching force. The statistics gathered from several Southern States last year indicated that 63 per cent of the country teachers at that time were teaching for the first time in the positions which they held. It is no rare thing for a country child to pass through his entire school experience without having the same teacher any two years. Such instability is destructive of the best educational work. The teacher does not remain long enough in one community to become really acquainted with the children or their parents or the conditions or activities to which she should adapt her class room work.

Experience has shown that the good country schools in the South are those which have succeeded in retaining their teachers, or at least their principals for a period of years. To bring about this continuity of service several things are necessary. In the first place the small one-room country school must gradually give place to the consolidated school, employing at least three teachers. The work of the one-room country school by its very conditions is bound to be more or less unsatisfactory. The teacher who wishes to achieve success in her profession naturally seeks favorable conditions for work.

The consolidated school offers opportunities for better classification, for a greater variety of activities, better incentives to effort on the part of the teacher and greater social incentives to good work by the pupils. The principal of the consolidated school should in most cases be a man who has been trained in elementary agriculture. He should be elected for at least three years of twelve months each. Near the school house he should have a home and a piece of ground which he himself may cultivate, and throughout the year the principal, the teachers and the school house should constitute a neighborhood social center.

We find great difficulty in retaining men as principals of country schools. There are several reasons for this. The salary we offer is usually not sufficient to command the services of a good man who has had a satisfactory experience. I do not believe that we shall ever succeed in making a profession attractive which involves only seven, eight or nine months' work during the year. The country school principal must be something more than a teacher of children. He must be a sort of community manager and must be given other functions which will employ him for the year and which will enable him to supplement the meager salary we are able to pay to one who merely teaches reading, writing and arithmetic.

In the schools of Switzerland I found that the country teacher was elected for twelve months in the year, was given a home at the school house for himself and family and a plot of ground which he could cultivate during the spare hours. He was also frequently the leader of the church choir, the secretary of the farmers' union, the treasurer of the cheese factory, or had some other function in the community which was not inconsistent with his duties as teacher and which developed his full capacity for work.

We will retain good men as principals of our country when we make the principalship of the school a good man's job. I realize that the movement in this direction will perhaps be slow. The older countries of the world have come to it, however, and I believe that our future development will tend in this direction.

The course of study in our country schools should have as its center the activities of the country community. It should open the eyes of our boys and girls to the opportunities which lie at their own doors. It should put meaning into their daily lives. It is just as easy to teach arithmetic with exercises which grow out of farm operations as with those which are related to the business of the town. The rural school reader may dignify country life and even the grammar and geography may have a rural setting. When our course of study thus dignifies the work which the farmer will have to do we will find fewer boys and girls who are dissatisfied with the farm.

I am very much pleased to note the fine educational enthusiasm of Middle Tennessee. In this State many of the tendencies which I have mentioned are now in operation. The matter lies largely in the hands of such men as are assembled at this farmers' institute.

Mrs. Guilford Dudley, President of the Nashville Equal Suffrage League, addressed the convention in the interest of the Woman Suffrage Movement.

Eli Haggard, the well-known lecturer, entertained the delegates with his lecture, "The Country Boy."

The convention then adjourned until 9:30 o'clock Thursday morning.

THIRD DAY—THURSDAY, OCTOBER 8, 1914.

MORNING SESSION.

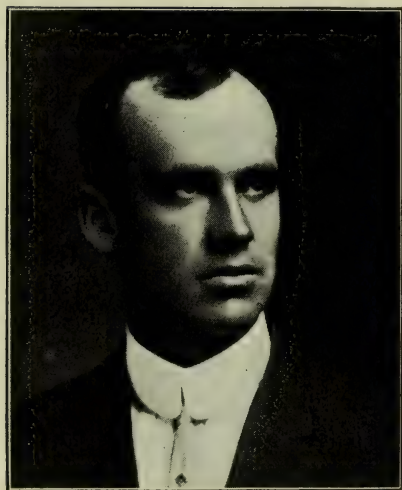
The convention was called to order at 9:30 o'clock, with President Robert Gallagher in the chair.

G. M. Bentley, State Entomologist, was on the program for an address on "Farm Practice in Insect Control," but was unable to be present.

Prof. L. R. Neel, editor of the *Southern Agriculturist*, addressed the convention on the subject, "The Farmer and the Farm Paper." Prof. Neel's address follows:

THE FARMER AND THE FARM PAPER.

BY L. R. NEEL.



Gentlemen: In speaking of the farm paper, and for it in its relation to the farmer, I am not introducing something new. Farm papers are older than most of the institutions that are now employed to instruct farmers and to help them with their problems. Some farm papers had been in existence a good many years when the first experiment station and college of agriculture was established. While farmers' meetings of some kind are very old, the farm paper antedates the modern farmer's institute many years. They also began before the educational, agricultural and live stock fair. We had some agricultural papers in the neighborhood of three-quarters of a century ago. Some that began publication fifty years ago

are still in active existence, and very many are forty years old.

While the farm paper is not a new institution, it has undergone many changes in a few decades. A very marked change has been the increase in number. Many more papers are published and the circulation of the individual papers has grown wonderfully. Papers that had ten or fifteen thousand subscribers a decade or two ago, now have a hundred thousand or more. Several now have subscription lists that run into the hundred thousands.

This has been made possible by an increase in population and by an increase in the reading habit. Each decade sees a very considerable increase of families on the farm, but the growing desire for reading matter that will help with the

daily problems has been the greatest cause of the rapid strides agricultural papers have made in subscription lists.

Twenty or twenty-five years ago not nearly every farmer took an agricultural paper. Even among the well-to-do farmers were many non-readers of agricultural papers. There are a few today, but only a few. Then among the smaller farmers and renters were but a small per cent of subscribers. This condition has changed until the farm paper goes to the home of most small farmers and to a large part of the renters.

While one farm paper used to satisfy a farmer, now it takes several for the same man. To illustrate: Between twenty and twenty-five years ago one monthly agricultural paper came to my father's house. A few years later he stopped this and subscribed for a weekly. In a few more years another was added. The process has gone on until now as many as a half-dozen agricultural papers go to that home. This is a history of thousands of cases. There is no one agricultural paper that will satisfy many of our farmers who are thirsty for agricultural information.

Farm papers have greatly improved in the character of reading matter and illustrations furnished. Modern methods enable them to get more life-like illustrations. The agricultural experiment stations and the greater facility for traveling to keep informed enable the papers to speak with greater authority. Before the days of experiment stations farm papers had to give as their opinion what they can now give as proven facts because of the tests made by the experiment stations. They are more accurate now than they could possibly be with the tools they had to work with in the past, though this is no reflection on the grand work that they did in their pioneer days.

A single copy of an agricultural paper is not a complete something by itself. It serves its purpose and no one feels that it is the part of something, but it takes all of the issues of a year to complete the volume. This is a pretty good miniature encyclopedia of agriculture. Hundreds and thousands of subjects are touched and most everything about the farm and the home receive attention. Soil improvement, fertilizers, stable and green manures, drainage, terracing, preparing the land, cultivating the crop and finally harvesting and disposing of it all are discussed. All kinds of live stock and poultry and their care are treated. The orchard, the garden and the flower bed receive attention. A department is devoted to dairying, one to animal ills, one to all kinds of farm questions, one to questions that come up in the kitchen and in the home, often a department is devoted to the interests of the boys and girls. A little poetry, a few jokes and little lighter matter just to make pleasant reading may be added to make the paper complete. It tries to make its interests as broad as the farmer's.

Not many years ago those who followed the advice of agricultural papers often won the title of "paper farmers," or "book farmers." We still occasionally hear the terms, and they fit some agricultural articles and a few books, but the standing of farm papers and books is rapidly becoming stronger.

So long as a farm paper is true to its ideals, its contents do not deserve being designated as "paper farming." It gives the actual experience of farmers who have been successful with the thing they are telling about and the conclusions that agricultural college and experiment station men have drawn as the

result of careful tests made at experiment stations and of investigations on farms all over the country. This isn't book farming. It is just as practical as it is for the farmer to teach his new but earnest man how to prepare a seed bed. In one case the instruction is written out, and in the other it is told by word of mouth and by showing. It is true that the last method may be preferable, but telling how to do some farm work or to manage some rotation in print is just as honest and has the great advantage of reaching numbers.

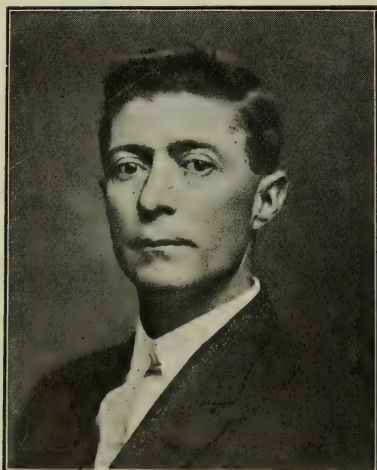
It is just as good to learn how to grow alfalfa by reading articles telling how it is done and was done as it is to learn how to grow the crop from one's father, provided the instructions are followed in the one case as in the other, and that the method is adapted to the local conditions of the farmer. Real "book farming" should only be applied to the kind of stuff that a larger number used to turn out and that occasionally creeps into papers now. These writers told or tell about something that doesn't exist or they plan out how something ought to happen when they haven't the experience back of them that justifies their conclusions. This kind of material deserves to be condemned, but it is scarce in agricultural papers.

The farm paper is not unlike an up-to-date farmers' institute. The instructors are experienced farmers, trained college and experiment station men, farm demonstrators, country life workers and the editorial staff. The audience is the farmer and his family. The instructors talk to the farmers and the latter have the privilege, which they use, in talking back or asking questions where something has not been made plain enough.

R. T. DeBerry, Assistant Commissioner of Agriculture, delivered an address on "Home Gardening." His address follows:

HOME GARDENING.

BY R. T. DeBERRY.



Mr. Chairman and Gentlemen of the Institute: I want to talk to you for a short while this morning on a line of farm work which has not in the past had the attention paid to it which the important part of it plays in every-day life entitles it, and the particular line to which I have reference is that of "Home Gardening."

Now, if I were to ask you gentlemen how many of you make a garden at home, probably every hand before me would go up, but if I ask how many of you pursue any systematic course of gardening to supply the needs of your own family, probably very few hands would be held up; in fact, I doubt whether any of you could afford to

answer in the affirmative to that question. I know that practically every one of you do what we call, by courtesy, gardening in the spring, that is, we go out

and break up the garden plot and we plant early peas, onion sets, beets and sow a few cabbage seed for plants, then we go away to the fields and get so busy that we leave the good wife to wrestle with the weeds and grass for the balance of the season, and if it happens to be a rather dry season, she holds her own against them for awhile, but after the soil has become thoroughly warmed up and sufficient moisture comes, the weeds and grass begin to gain ground and in the course of two or three weeks they get such a start that her task becomes hopeless and she gives up in disgust.

We go about our gardening in this haphazard way because we do not fully realize just how great a part the home garden may play in reducing the present high cost of living, but to get the best results we must go about our work in the garden with just as much system as would be necessary to make the growth of field crops successful.

It has been said that a European family will live on what the average American family allows to go to waste. While I do not believe that this statement is entirely accurate, yet there is no question but what they do manage to save a great deal more of what they make than we do, and this is due to the fact that they pay a great deal more attention to small details than we Americans do, and by an intensive system of handling all of their affairs get much greater returns for any given area under cultivation than we are able to do with our slipshod methods on the farm and in the garden.

One of those little countries over there has, I am told, \$100 on deposit in the savings banks for every man, woman and child in the entire country. That means if their families run five in number, as ours do, that each family has a savings fund of \$500, and that represents something over and above what they need to live on at present, a nest egg, as it were, for a rainy day. I would like for you gentlemen to stop for an instant and think what it would mean to our State if every family in its borders had that much laid aside to be used only in case of some pressing emergency. It would relieve us from the annoying apprehension that interferes with the peace of mind of most of us, the fear of not being able to meet our obligations promptly.

This may seem to you foreign to my topic, but I mention this to show you what is possible if you take advantage of one of the many opportunities that are presented to the American farmer for reducing the cost of living, which of course increases the chances of saving.

But in order to derive the fullest possible benefit of reducing the cost of living and thereby being able to save more through the means of the home garden, we must go about making it in a systematic way, and the ground devoted to this purpose must be utilized to the fullest extent possible throughout the entire growing season, instead of for the first sixty days, as so often is the case at present.

Where a good system is followed during the entire growing season we may not only supply the needs of our own family, but there will nearly always be a surplus that we may dispose of at remunerative prices, and this surplus from home gardens all over the State would go far toward supplying the demands of those in our State who do not grow vegetables and keep at home a very large per cent of the money which is being sent out of the State for vegetables, this amount coming in from other States being at present estimated at 75 per cent of the total amount consumed by our people.

But as my time is limited, I must make you some suggestions as to how to go about utilizing the garden to the best advantage, and I think that laying off the garden properly will greatly aid in your further operations.

The garden spot should be laid off in an oblong rather than square shape, as this will facilitate cultivation with horsepower tools and thus lessen the expenditure of hand labor, which is the costliest kind that is in use today.

About three times as much ground should be set aside for garden purposes as we expect to use in any given season, as this will allow the practice of a systematic rotation and thereby lessen the chances of insect depredations and attacks of plant diseases that are encouraged by growing vegetables on the same spot year after year.

Use one-third of the garden for your crop each year, keeping one-third in first-year red clover and the remaining third in second-year sod, which is to be broken up deeply the fall preceding its use for vegetables, this deep breaking being essential for two or three reasons, chief among them being that it allows all of the water that comes down during the fall, winter and early spring months to go down into this broken strata of earth and be stored there for the use of the crop instead of running off over the surface as would be the case were it broken shallowly; another being that by allowing the air to penetrate to every part of that soil much plant food will be rendered available for the use of the plants that might, except for the deep stirring, remain so locked up that they would be unable to get at it.

This breaking should be done in October if possible, and the ground allowed to lie as broken until mid-December, when it should be bedded up into rows of the desired width and leaving in this shape until ready to plant in the spring.

It will not be necessary in the spring to do anything to this ground except to harrow the rows down until they are of the desired height and then plant your seeds or set your plants in the ordinary way.

Surface cultivation to keep down weeds and grass and produce an earth or dust mulch will be found to be all that is needful to produce maximum crops of high grade vegetables.

As fast as one crop comes off some other should be planted so as to keep a succession during the whole season, and where this is done the average man will be astonished at the amount of food which can be grown on a small area.

Mr. T. Graham Hall, President of the Tennessee Fire Prevention Association, was introduced to the convention, and addressed the delegates on "Fire Prevention." His address was as follows:

FIRE PREVENTION.

By T. GRAHAM HALL, PRESIDENT OF THE TENNESSEE FIRE
PREVENTION ASSOCIATION.



Out of the great economic unrest that has swept over our country has come the demand for fire prevention. The Tennessee Fire Prevention Association was organized four years ago and is affiliated with the National Fire Prevention Association. Its object, as may be inferred from its name, is fire prevention—the prevention of fires.

Once each month this association visits some Tennessee city where its members inspect each business and manufacturing risk, with a view to pointing out defects or making some recommendation that would improve the standard of the risk, and, it may be, prevent a fire. We then hold a public meeting, where our committees report on the condition of the water-works and electrical equipment, and offer to the Mayor and Aldermen a set

of model laws and ordinances for adoption by the city government.

When we begin to study the question of fire prevention, we find that the older countries of Europe have been dealing with the problem for more than six hundred years. We all know the story of how roast pig first became popular. The Chinaman, whose house had burned, found that his pig had been roasted under the house, and when he went to move the pig he burned his finger and stuck it into his mouth to cool. The taste delighted him so that he ate the pig, and then he and his neighbors began to burn other houses in order to roast their pigs. And so we have gone on building and burning property throughout the years, when we might have builded better, prevented the fires and saved the wealth involved in the destruction.

Mr. Frank Locke, in his address before the International Association of Fire Engineers, informs us that in the year 1302 one Thomas Bat came before the Mayor and Aldermen of the City of London and guaranteed to indemnify the city against any damage that might result from fire in any of his buildings covered with thatch, and agreeing to have them recovered with tile. Out of this problem grew fire insurance, and, until the great fire of London in 1666, the insurance companies maintained the fire department of London, which at the time it was taken over by the city, fifty years ago, was composed of 127 men and maintained at an annual expense of \$125,000. This will give you some idea as to how slow the government has been to recognize its responsibility to safeguard the interests of the people in this respect.

During the last fifty years we have evolved the magnificent fire-fighting apparatus of today, but we are now learning that the old adage is true that an ounce

of prevention is better than a pound of cure, or that a stitch in time saves nine, and our activities and expenditures are being turned to preventing fires rather than extinguishing them, to fire prevention instead of fire-fighting.

When we consider that the wealth of our country is being destroyed at the rate of \$500 each minute, \$30,000 each hour, \$720,000 each day and night, or more than \$250,000,000 a year, we may well pause to ask how long a nation can withstand such a waste of its resources. Just think what it would mean to turn this enormous stream of destruction into channels of constructive activity in the up-building of all the communities of our land. Think what it would mean if we could spend this vast sum in revitalizing the soil, conserving waste land, building good roads and good schools. Three-quarters of a million dollars each day and night—enough each twelve months to pay for the building of a Panama Canal.

When we learn that one-half of the fires originate from preventable causes we come face to face with our own personal responsibility in the matter.

When we hear of a fire we usually ask whether or not the property was insured, and if we learn that it was insured, we are inclined to dismiss the subject, believing nothing has been lost, but if we analyze the case, we find that the other policyholders paid the money which the insurance company returns to the unfortunate policyholder, and that in reality the people pay the loss themselves, and that the only way to reduce the amount of fire insurance premiums will be to reduce the fire losses, since enough money must be collected from the people to pay the losses. So this comes home to you and to me as our own individual problem and responsibility.

Here in Tennessee the fire insurance companies have paid to property owners \$49,000,000 during the last twenty-eight years. Three million dollars paid for the destruction of Tennessee property during 1913. The policyholders of this State paid these losses, and they are paying at the rate of three million each year. If they would save this money for other purposes they must prevent faulty construction, defective flues and chimneys, criminal carelessness and incendiaries, and thus prevent the fire waste.

Fire prevention is now being taught in some of the schools, and one department of this association's work is to visit the schools and present the subject to both teachers and students. We believe the next generation will realize the importance of fire prevention.

Like every other movement, we encounter opposition and indifference at the hands of the people, just as the movement to establish boards of health was opposed on the grounds of personal and individual rights and freedom, but we are able to proclaim the new doctrine that no man has any rights that interfere with the rights of his neighbor, nor has he any right to build in such manner as to endanger the life or property of his neighbor, and that if he is unwilling to protect his own property, his neighbor is entitled to protection, and, furthermore, that no man has a right to endanger or destroy his own property. Property and wealth are for use—right use—and no man or men possess the right to deprive our nation of its resources.

Thus, my friends, out of fire insurance were fire departments evolved, and out of these has come fire prevention, and so, if we can bring to you a realization of your responsibility in this work, we will have accomplished our purpose in coming before you at this time.

Mr. Thomas H. Bradford, President of the Tennessee Burley Tobacco Co., addressed the convention as follows:

THE ADVISABILITY OF PLANTING TOBACCO.

BY THOMAS H. BRADFORD, PRESIDENT TENNESSEE BURLEY TOBACCO CO.



Gentlemen: It is my pleasure to appear before you and to speak to you of tobacco, hence the subject of this address will be "The Advisability of Planting Tobacco in Middle Tennessee." The subject of tobacco is one which is broad, but I will try to specialize in one type of tobacco which should prove more interesting to you from a financial standpoint than any other.

Years ago Middle Tennessee produced some tobacco, and some of the oldest inhabitants remember that tobacco of a good grade was grown, but time and changing conditions, and the lack of a nearby market to facilitate the handling of crops, brought tobacco cultivation into disuse, and now we see very little of it planted. To you it is practically a new crop. In Nashville

we have established a market, and my mission to you is to tell you of that and to persuade you that growing Burley tobacco and the proximity of the Nashville market will mean much toward increasing the value of your lands, increasing your income and promoting a general era of prosperity.

The farmer before trying out a new crop naturally wants to know everything about it—whether there is money in it; whether he can save money by growing it and use it in the running and upkeep of his farm; whether conditions are suitable and right for the growth of the crop. Conditions must be right, namely: the land must be adaptable and also the climate. The crop must not interrupt the general system of farming. This new venture must not cost too much in new equipment; the cultivation and care of the crop must not cost too much in proportion to the returns; and lastly, the land from which you derive a living must not be exhausted to such an extent that it will render it unfit for succeeding crops.

In speaking of tobacco, I will endeavor to show that you have the soil and the climate, and that you can afford the equipment, also the cultivation will not cost too much and that a crop of tobacco will not interrupt the farming activities, but will work hand in hand with them. I will also try to show that your soil value can be conserved, and finally that tobacco intelligently grown and cared for will prove to be the biggest money crop you can grow.

When I speak of tobacco I will always mean Burley tobacco, because this country embracing Middle Tennessee is eminently suited to it, and Burley tobacco will bring a much larger return per acre than any other grade of tobacco.

Burley tobacco was first discovered in Southern Ohio about 1866. Since then it has had a phenomenal run, and the demand exceeds the supply so greatly that the manufacturers can hardly keep eight months' supply ahead, and year by year the demand is increasing. The character of the leaf is nearly neutral and possesses great absorbent qualities. It is used chiefly in the manufacture of smoking, plug and cigarette tobacco, and a startling fact is that during the past year the consumption of Burley increased 60,000,000 pounds. You have no doubt noticed the advertisements in the papers of different pipe tobaccos made out of Burley tobacco which is grown in Middle Kentucky. Manufacturers have advertised these tobaccos so greatly that the public consumption has increased so materially that all the large manufacturers have been up against it to get enough of the Burley tobacco from which these brands are made to half way satisfy



Tobacco on Farm, Hillsboro Pike, 15 Miles from Nashville.

the demand. The area in which Burley was originally grown was so small that it began to spread and is still seeking new fields. From Southern Ohio it followed a limestone formation, famous for its blue grass sod, which extended through Middle Kentucky. This same formation extends through and embraces Middle Tennessee. Burley has made Middle Kentucky famous, and is gradually pushing its way down into Tennessee, as is evidenced by the large amount of Burley grown in Sumner County last year, and also in Williamson County. In Williamson County a finer type of Burley was raised than was ever raised in Kentucky, and the American Tobacco Company and different tobacco interests have exploited and experimented in Tennessee to the end that they may increase the acreage of Burley tobacco.

You will find that on that kind of soil on which wheat will grow successfully, which is well drained and has a rolling tendency, Burley tobacco will grow to great advantage. However, virgin land is the best, from which white oak, maple, walnut and hickory has been cut. Any blue grass sod or clover sod is adaptable and fine. It has been known that this type of tobacco will follow corn and wheat where the land is fertile.

Your climate is a shade better than Kentucky—the frosts are not so early and the changes are not so intense. Tobacco can be grown in seventy-five days in Tennessee, where it is in the ground ninety days in Kentucky, and on account of the adaptability of the climate tobacco will cure up and color better in Tennessee than in Kentucky, and there is no reason why every county in Middle Tennessee which now grows wheat should not grow millions of pounds of Burley tobacco. The land is right, as is the climate, and experiments have proven that it can be done.

One farmer cannot plant tobacco on a big scale like he can wheat, unless he raises it on the shares. One family, if they know anything about tobacco,



Burley Tobacco Field in Williamson County.

ought to be able to raise about ten or fifteen acres. The landlord, of course, furnishes all the equipment and receives half the crop. Where tobacco raising is to be gone into each farm should have a model tobacco barn. However, any good-sized, roomy, well-ventilated barn can be converted, because curing tobacco in a barn only needs a good deal of air in free circulation. However, a modern barn costs about \$1,000, and is a good investment. The tobacco setter, which the farmers say is much more satisfactory than setting by hand, costs about \$60. Its usefulness consists in the rapidity in setting out tobacco, and the fact that it makes the farmer independent of rain. The modern farm possesses the other implements necessary, such as plows, etc., because the cul-

tivation of tobacco is identical with that of corn; worming, suckering and harvesting represent the other charges. Careful estimates place the cultivation and handling of an acre of tobacco at \$30.

A farmer need not be interrupted in his other farming activities on account of tobacco. In February or March the plant-bed is burned and planted. The field to be used is plowed in April, and it is plowed again, disked and rolled in May and the plants are transplanted. In seventy-five days it is harvested and put in the barn. Then the farmer can use his field for any purpose. Now, it takes six weeks for tobacco to cure, and this time is when the activities of the farm are smallest. Anywhere from the first of November to April tobacco can be marketed in Nashville and cash money received for it.

Tobacco, as any other crop, will deplete the soil; in fact, it takes a great deal of potash out of it, but rotation and fertilization renew and better the soil.

After a crop of tobacco has been harvested and the tobacco stripped from the stalks, intelligent farmers plow under the stalks, which contain a great deal of potash, and then sow rye or crimson clover for a cover crop, which during the winter months can be grazed, and which give back to the soil largely what the last crop of tobacco has taken out. On virgin land as many as four crops of tobacco have been grown without fertilization. This will ruin the soil. The wise farmer will rotate his crops and get the best out of his land. The following is a good system of crop rotation on tobacco land:

Tobacco.

Wheat.

Clover and timothy.

Clover and timothy.

Crimson clover and rye.

Crimson clover and rye.

This gives a good clover sod, which, when turned under and prepared for tobacco, makes excellent tobacco land. By this method the highest quality of soil fertilization is maintained. The modern trend is to apply scientific principles to farming, learn from individual experiments and close observation. The intelligent farmer can always tell when his land is wearing out. Then is the time to fertilize it. A good fertilizer for tobacco land is made up of 2 per cent nitrogen, 8 per cent potash, 2 per cent phosphoric acid. If this is mixed by the farmer it is cheaper. This fertilizer is fine for any tobacco, and will insure an elegant crop.

Labor is the source of worry and trouble to all farmers. We well know that in Middle Tennessee the labor situation is bad. You think that tobacco requires more labor than any other crop, and hence is more expensive to grow, but I say that it is not. When tobacco years ago was planted it took an army of slaves to cultivate and raise it, but now the ingenuity of man has overcome these handicaps. Tobacco requires no more labor than the crops you have on your farm today.

I have cited the fact of the tobacco transplanter, which will save your labor. I have also stated that tobacco is cultivated like corn. It is never hoed. The land is cultivated cleanly, the soil is in good shape. After the plants are set out it will need to be plowed deeply once, with two or three later shallow

cultivations. When tobacco grows to a certain height it is impossible to either hoe or run a plow through it. Then is the time to take care of the worms and to pull the suckers off. There is no necessity for putting an army of men in the field to kill the worms; arsenate of lead or Paris green will do the work more efficiently. With the modern Paris green dust guns and the different sprays on the market any field hand can cover many acres of tobacco a day. Suckering tobacco is really where a good deal of the labor comes in, because each plant has to be personally attended to, but you only sucker the tobacco once or twice and then top it, and your ordinary farm labor seems sufficient to take care of that. You would probably need some outside help, but that would not cost you much in proportion to the returns you get from a good crop. Harvesting tobacco is simple, much simpler than harvesting wheat, and uses less labor. Stripping and preparing tobacco for the market can be done when there are the least activities on the farm. Tobacco is a money crop, it is a cash crop, more so than wheat. Just to show you the relative value of tobacco and the three principal farm crops I will quote statistics from the last United States Census Report, as follows:

Wheat.

Average value per bushel.....	\$.96
Average value per acre.....	14.86
Formed 12 per cent of the total farm crops.	

Corn.

Average value per bushel.....	\$.56
Average value per acre.....	14.62
Formed 26 per cent of total farm crops.	

Oats.

Average value per bushel.....	\$.41
Average value per acre.....	11.79
Formed 7 per cent of total farm crops.	

Tobacco.

Average value per pound.....	\$.10
Average pounds per acre.....	819
Average value per acre.....	\$80.55

You can readily see the profit and desirability of putting out tobacco. Many a mortgage has been raised off a farm by growing it, and tobacco planters on a large scale have made fortunes out of it elsewhere. Your lands will increase in value if you raise tobacco. The more income your farm produces per acre, proportionately its value increases. In Robertson County, Tennessee, land for years was practically valueless until they started raising tobacco on it. Now its value has increased five times. In the blue grass regions of Kentucky the famous stock farms have been plowed up and planted in tobacco. Here you have the opportunity of a lifetime to start raising tobacco, bettering your incomes, and, as I said before, producing a general era of unprecedented prosperity. I am not a farmer. I am interested in tobacco from its farm standpoint, of course, but I am more vitally interested in seeing Nashville established as a tobacco market. We have gone to the trouble and expense of building a loose-leaf ware-

house in Nashville, a place where you can bring your tobacco when it is cured. You can get the best value out of it, because you can sell it for cash, and if you are not satisfied with the price that it brings you have the privilege of selling it over at the next sale with no extra charge.

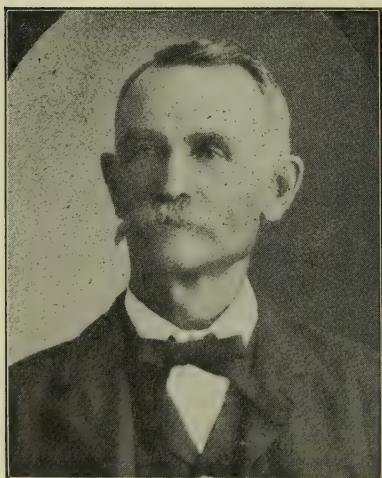
A small portion of Tennessee produces about 72,000,000 pounds of tobacco; all of Tennessee should produce about 400,000,000 pounds, as does Kentucky. Even Kentucky told me, through the voice of its State Experimental School at Lexington, that Middle Tennessee was just as adaptable to the culture of tobacco as Kentucky, and should produce as much.

You gentlemen have the land suitable to growing Burley tobacco, and the climate, and I have tried to convince you of the desirability of the crop. It is up to intelligent farmers, such as you, to take up new things, such as tobacco, and prove that what I say is true. Your fortune awaits you. In your pride for your State if you make Middle Tennessee a tobacco-producing section, you will feel that you have made one of the greatest States in the Union greater.

The last number on the program was an address on "Silos and Silage," by J. N. Meroney, of Maury County. Mr. Meroney's address follows:

SILOS AND SILAGE.

By J. N. MERONEY.



MR. PRESIDENT AND GENTLEMEN:

The subject assigned me this evening, "Silos and Silage," is one of growing importance to the Tennessee farmer and one in which I have been deeply interested for more than twenty years in a practical way. And I take it for granted that you farmers need practical, well-established facts to guide you rather than untried theories.

It is a well-known fact that the population of our country is increasing very fast, and they must be fed and clothed. The farmer has this job on his hands. He must recognize its immensity and prepare for the task. But it is also a fact known to all intelligent farmers that the area of our cultivating lands have about reached their maximum acreage, and if the present crop production is only sufficient to supply the present demands then there must be increased production or somebody will go hungry, and as there are no more acres to cultivate, then we must increase the production per acre.

How to do this is now an important question with the American farmer. The agricultural departments of the United States and many of the States are working faithfully to help solve this problem. They are demonstrating

facts that will help us if we heed them. They show us that the fertility of our soil must be improved to meet the increased demands made upon it. We must adopt better and more economical methods of cultivation.

It is a known historical fact that no agricultural country has ever maintained its fertility without growing live stock on the farm. We must grow more cattle so as to feed the crops grown largely back to the land in manure. Sell off a finished product instead of the raw material in grain and hay.

Then if cattle-feeding on the farm is necessary to sustain its fertility our efforts should be directed toward the most profitable and economic manner of feeding them, and this idea leads us directly to the silo and the use of silage on the farm.

I think it is hardly necessary for me to go into a detailed explanation of what a silo is, for you all know it must be an airtight structure, though it may be built of various materials and of different shapes.

But the round silo, built at least to a height of twice its diameter, is the most satisfactory and economical.

There is a wide range in the cost of silos on the farm. There is one in Tennessee recently built that cost \$1,200, and there is another one in Tennessee that has been in use and giving entire satisfaction for twenty-one years that cost less than \$60. So there is a wide margin in the item of cost to choose from.

But there should be a silo on every farm in the State, for it is just as much an economic necessity as the corncrib or the smokehouse, and the cost can be suited to any farm.

The idea has been advanced that a silo is a luxury, that only the large farmer or the rich man can afford. This is far from the fact. The small farmer who needs to make every dollar count is the man who needs it most, and I now come to plead with the small farmer to make use of this method of getting twice the value he is now getting for his labor.

Why grow a crop of corn and throw away half of it, when it is easily within his power to realize its full value? It has been fully demonstrated by many careful experiments that the corn crop when fed as good silage has more than twice the feeding value of the dry grain and fodder for making beef or dairy products, and as there is no doubt of this fact, and also that the cost of construction can be limited to the amount he is able or willing to put into it, I see no reason why there should not be a silo on every farm.

A round stave silo can be built on the farm by any farmer handy with tools at a cost of about \$1 per ton capacity, and a 50-ton silo will pay for itself the first winter in feeding fifteen or twenty head of cattle, then there would be no further cost for the next ten or fifteen years.

But you want to know about filling the silo after it is built, and the crop to grow to fill it. After twenty-two years' practical experience I find there is nothing better than one of the prolific varieties of corn and cowpeas or soy beans, mixed by cutting together in filling. Any kind of a feed-cutter will do to cut up the green mixture.

In many sections the men who own thresher engines have supplied themselves with cutter and blower and make it a business to fill silos for the neighborhood, just like they thresh their wheat. This is a practical and cheap plan. As for myself, I have just finished filling my silo. I have a small cutter with a

chain elevator that I have used for seventeen years. I run it with a 5-horsepower gasoline engine. This rig cost less than \$200 and gives good service.

So let me urge again to build a silo, feed more cattle on the farm, save the manure, increase the fertility of your soil, cultivate less land and do it better, make larger crops on fewer acres and make more money on the farm.

We farmers, I know, are slow to change our methods of farming. We have been standing still and not going forward. But Capt. Peck has been injecting his get-up-and-get medicine into us Tennessee farmers for three years and we are feeling its effects. We see more deep fall plowing done, more winter cover crops are being sown, more attention is given to better seed and better cultivation. We see more silos being built and more cattle fed. We are coming sure.

The Committee on Resolutions made its report, and the resolutions offered were unanimously adopted. They are as follows:

RESOLUTIONS.

Assembled in our thirteenth annual convention as members of the Middle Tennessee Farmers' Institute, we, the farmers of Middle Tennessee, express our gratitude to an All-Wise Providence for the bountiful crops that have blessed us in the past years, and that we are citizens and a part of the great State of Tennessee, and that we are blessed with climate, soil, rainfall and other conditions unexcelled anywhere in the world for the profitable pursuit of our calling. In this time of a great war which is convulsing the eastern hemisphere, and bringing death to thousands and thousands of the flower of the young manhood of the countries of Europe and untold suffering and misery to many millions of their people, we feel that we are indeed blessed in living in a land of peace and where plenty is at our call.

The people of Tennessee are to be congratulated that the affairs of our State government are in the care of competent and faithful public officials, and we especially congratulate the people of the State on the fact that they have at the head of the Department of Agriculture a man who is so well qualified to administer the affairs of that department as Commissioner T. F. Peck. Since he took charge of that department much valuable work has been done by him and his assistants in the department in the promotion and development of agriculture in the State. Working in conjunction with the Federal Government, the State Department of Agriculture, through its State Veterinarian, Dr. George R. White, has freed the State of the Texas fever tick, and the markets of the world are now open to Tennessee cattle producers. The anti-hog cholera serum plant, operated by the Department of Agriculture, is now furnishing serum to the farmers of the State at cost, and the department has, with an appropriation of \$10,000 for the purpose, within one year built up an establishment that now has a value more than double the original cost, and this will serve in the next few years to entirely eradicate the hog cholera scourge from the State and save the swine breeders of the State many millions of dollars. With an appropriation of \$7,000 the department has established a chemical laboratory, with an experienced chemist in charge, for the purpose of analyzing commercial feedstuffs, fertilizers, soils, etc., and for testing the purity of field seeds, and this laboratory is saving the farmers of the State each year many

times its cost. The revenues of the State from the sale of fertilizer tags, and feed and seed stamps, through the enforcement of these laws by Chief Feed and Seed Inspector A. L. Garrison and his assistants, have been increased, and this at a greatly reduced cost in their collection. As farmers who are familiar with these facts, and in justice to the officials of the Department of Agriculture, these statements are made, and we feel that they should be made a part of the records through the resolutions of this Institute.

We favor the election to the next General Assembly of Senators and Representatives who will vote for appropriations to the Department of Agriculture sufficient to carry on the work as at present outlined, and for such other appropriations as will tend in their expenditure to foster and extend the great agricultural industry. We desire to again go on record as favoring the appropriation for agricultural extension of all the revenues collected by the Department of Agriculture. This revenue comes from the farmers of the State and it should be expended in their interest and for their benefit.

We especially indorse a continuance of the institute work as conducted by the Department of Agriculture, and we are strongly opposed to any change in the present system of conducting the division institutes.

We indorse and commend the work of the Department of Agriculture through the Bureau of Immigration in its efforts to bring desirable immigrants into the State. Tennessee has room for and will welcome all who come with an honest purpose to make good citizens. We feel that the next General Assembly should make a more liberal appropriation for this purpose than has been done in the past, especially in view of the fact that present conditions in Europe, and conditions likely to follow the end of the great war, will send to this country many thousands of homeseekers. Tennessee should be in position to make its advantages and opportunities known.

We urge the continued support of the State to the Tennessee State Fair. It is an educational institution belonging to all the people of the State and is doing a great work in exhibiting to the people of our State and of other States our splendid resources and advantages as an agricultural and live stock community.

We realize the value of good roads to the people of a community, and that one of the greatest needs of the State is a better system of public highways, and sensible legislation that will tend in this direction. We therefore favor the enactment of a law creating a State Highway Commission, with an appropriation sufficient to permit of the employment of a competent engineer, to work under the direction of the commission with such counties or communities as may need and call for his services in the location or relocation of public highways. We also favor the working of the State convicts on the public roads, or at least legislation by the next General Assembly looking to the appointment of a commission to inquire into and make report on the feasibility and advisability of this step.

We appreciate the work of the State Pure Food and Drugs Department under Dr. Lucius P. Brown, and recommend that the next General Assembly provide the necessary appropriations for the continuance of the good work of this branch of the State government.

We also indorse the act of the recent General Assembly in creating the Bureau of Vital Statistics, and believe that the work of this bureau will do a

great deal to bring about better conditions in the State as regards the health of the people, and we urge a continuance of appropriations necessary for this work.

In view of the fact that the cotton planters of the South have a surplus of more than 4,000,000 bales of cotton, as a result of the decreased demand caused by the European war, and the cotton planters of this State are affected by this condition, we recommend a reduction in acreage of the 1915 cotton crop. We urge that a great part of the acreage heretofore in cotton be utilized in the production of foodstuffs, for which there will always be a profitable demand, and an especially increased demand in view of decreased production of foreign countries as one of the results of the great war.

We extend the thanks of the members of this Institute to Capt. T. F. Peck, Commissioner of Agriculture, in making arrangements for this meeting. We appreciate the courtesies of the railroads of Middle Tennessee—the Louisville & Nashville, the Nashville, Chattanooga & St. Louis, the Nashville Interurban, the Nashville & Gallatin Interurban, and the Tennessee, Kentucky & Northern—in transporting the delegates free of charge to and from this Institute. We extend the thanks of the Institute to the officers, President Robert Gallagher, Vice-President W. W. Ogilvie and Secretary T. G. Settle, for their faithful work. Our thanks are also extended to the newspapers of Nashville for their reports of these meetings, to the Trustees of the State Fair for the use of this building, and to Secretary J. W. Russwurm for courtesies.

We extend a special vote of thanks to Col. Robert Gates, the representative of the railroads, for his deep interest in institute work among the farmers of the State.

To the people of the city of Nashville we are indebted for a pleasant time in their city and invite them to visit us at any time. The latch string is on the outside and they are always sure of a welcome.

M. L. TAYLOR, *Chairman*.

J. N. MERONEY.

JAS. H. PORTER.

ELECTION OF OFFICERS.

The Committee on Nominations made the following report:

For President, H. A. Clark, of Bedford County.

For Vice-President, J. N. Meroney, of Maury County.

For Secretary, T. G. Settle, of Davidson County.

The report of the committee was unanimously adopted and the gentlemen named were declared the officers of the convention for the ensuing year.

The convention then adjourned.

PROCEEDINGS OF THE MIDDLE TENNESSEE HOME-MAKERS' ASSOCIATION.

FIRST DAY—TUESDAY, OCTOBER 6, 1914.

The fourth annual session of the Home-Makers' Section of the Middle Tennessee Farmers' Institute was opened in the Woman's Building at the State Fair Grounds, Tuesday morning, October 6, with the President, Mrs. Clara Boone Mason, in the chair, and all officers present.

Rev. Allen Fort, pastor of the First Baptist Church, was introduced and addressed the association. He said that the poor are constantly seeking to get away from the hovel called home and that the rich have too many homes, so that they flit from one to the other, either extreme tending to break up the home life. This is, possibly, partly responsible for the terrible evil of divorce which is a danger and a disgrace. The country woman must help to solve this grave problem, for divorce is less prevalent there in the country than in the city. The wife everywhere must learn to be a true "helpmeet" and not just a "help-eat," for more and more is the wife an important factor in the conserving of the family income as well as health. Husband, too, must be more than a mere provider; he must be a real companion. Home, today, needs the old-time family altar. God and Christ should have a place in all the plans of the household. He closed his remarks with prayer.

Mrs. J. Taylor Stratton, First President of the Home-Makers, made the address of welcome.

The response to the address was made by Mrs. Hugh English, President of Giles County Home-Makers.

Mrs. C. W. Baker, the Director of the Woman's Department of the State Fair, made a report of the great activities of her many helpers. Mrs. Baker said in part:

REPORT OF WOMAN'S DEPARTMENT, STATE FAIR.

Madam President, Ladies of the Middle Tennessee Home-Makers:

The Woman's Department of the 1914 State Fair is history. But the Woman's Department of future fairs will have to work early and late to surpass the splendid exposition of woman's work that was this year entered in the Woman's Building.

The new building, equipped especially for the showing of art treasures, dainty needle work and rare culinary dainties, was all that could be desired, and never before in the history of the fair have all classes of woman's work been displayed so advantageously.

Your director was amply repaid for her work, and I shall always feel a lasting debt of gratitude to Tennessee women who rallied so royally and so loyally to the support of the Woman's Department of the 1914 fair.

The Chairman of the 1913 Better Babies' Contest, Mrs. Y. W. Haley, was prevailed upon to accept the chairmanship of the 1914 contest. Three hundred babies were examined this year and we had one 100 per cent baby and three 99.5 per cent babies.

Three new departments—the Tennessee Hall of Fame, the Department of Civics, and the Department of Relics, Curios and Antiques—were decided upon.

Mrs. W. B. Shearon, well-known to magazine readers throughout the country, accepted the chairmanship of the Hall of Fame. Working zealously with Mrs. Shearon in this inspired and inspiring work were Miss Kate White, of Knoxville, and Mrs. Geo. W. Denny and Mrs. Chas. R. Hyde, of Chattanooga; Mrs. Isaac Reece, of Memphis; Miss Martha James, of Nashville, and others. Too much praise cannot be given Mrs. Shearon and her committee for their great success, Tennessee's first Hall of Fame.

Mrs. Walter L. Jones was prevailed upon to accept the chairmanship of the Civics Department. She rounded up such a magnificent array of civic club banners, civic literature, leaflets of all kinds for free distribution and made such a bower of beauty of her booth with potted plants, hanging baskets, window boxes, attractive market baskets and rare and lovely bouquets of cut flowers the Civics readily sprang to the forefront as a popular and educational part of the Woman's Department.

The Better Babies booth and the Health booth were sources of constant interest to the passing throng and the exhibit on the Prevention of Infant Blindness, in the Better Babies booth, and the Anti-Tuberculosis Exhibit from the Health Booth were so popular that by special request of a member of educational authorities in the city they were removed to the Carnegie Library, where they may be seen for the next two weeks.

All departments so far touched upon have been educational in their value, and following out the educational idea still further were the pure food and drug exhibits by Dr. Lucius Brown and the weights and measure exhibits whereby the cost of living might be reduced by watching the scales used by your local grocer.

Mrs. W. H. (Betty Lyle) Wilson served as chairman of the Culinary Department. Mrs. Wilson has made an international reputation on cakes alone and is widely known as the woman who has raised cake-making to a fine art. Best of all were the practical demonstrations given daily in the Woman's Building by Mrs. Wilson.

Mrs. Rush Hawes served as chairman of Needlework, and the needlework exhibits ran the gamut from doilies to lunch cloths, from booties to bed-spreads, and to Mrs. Hawes belongs the glory.

Miss Minnie Gattinger, chairman of the Art Department, secured an exhibit of all classes of paintings worthy of a Carnegie exhibit of the Nashville Art Association. There was no cheap or inferior work in the collection, for Miss Gattinger is high authority.

Ceramics and crafts cover a wide field of woman's endeavor and the exhibit in this department was well worthy of the discriminating taste and judgment of the chairman, Mrs. Chas. H. DeZevallos.

Photography is practically a new feature of woman's work, and this year Mrs. Marvin Wiles, the chairman, secured pictures of unusual merit, notable among which were some beautiful autocromes, which represent the highest art of photography.

In conclusion I would say that the success of this great Southern exposition of woman's work is due first to Tennessee women, to their patriotism and their loyalty, to every department chairman, to every county chairman, and especially to Mesdames J. G. Mason, Robert Nichol, and J. H. Acklen belong the honor and glory.

HOME-MAKERS ON AGRICULTURAL SPECIAL.

The Secretary briefly reported the work done by the loyal Home-Makers on the Agricultural Train. There was no money to employ speakers, but Mrs. H. A. English, of Pulaski, and Mrs. Rose Nipher, of Nashville, gave their valuable time, one for three weeks and the other for four weeks, and spoke as high as nine times a day many times.

The association adjourned until 2 o'clock.

AFTERNOON SESSION.

At the request of a majority in attendance, the session began at 1:15 instead of 2 o'clock as announced at the morning session.

The President called Mrs. John L. Walker, of Wartrace, Vice-President, to the chair while she read her annual address.

PRESIDENT'S ADDRESS.

The fourth annual meeting of our Home-Makers' Club is indeed auspicious in point of attendance, repaying the pioneer workers, to whom the results sometimes seemed far in the future.

This occasion brings with it an unvoiced question as to the passage of time since we last met. How we grow in strength, in the beauty and dignity of service, as well as in numbers!

Home-making is such a wonderful combination of the spiritual and the sordid, the cultivation of inner grace, to the accompaniment of homely duties, that we must avail ourselves of every opportunity within our reach.

As your presiding officer, I realize that the past year left a record to be given you. To measure by words the growth of a movement which affects not only the women of Middle Tennessee, but of the State as well, requires some one more skilled in the estimate of "things unseen" than myself. If one may judge by the interest manifested, our club may take courage, for we have inquiries from every section of the State, as well as other States, in regard to the purpose and plan of organization.

Through the kindness of Capt. Peck we had as representatives on the Agricultural Train at various times Mrs. Nippon and Mrs. English, who were successful in arousing interest and organizing clubs.

A depleted treasury prevented the organization of clubs away from the railroads and we regret that our efforts were so handicapped.

The Home-Makers' Club is unique in that it is the only club of its kind in the South. With similar purpose and aims "The International Congress of Farm Women" has been organized in the West, and holds its fourth annual meeting in a few days.

That we have reached the fourth year of our existence is cause for congratulation in this day of women's clubs when existence is won by a struggle, and the fitness to survive is well tested. If this movement is good for Tennessee, why is it not good for every Southern State as well?

As your representative, I had the pleasure of attending the meeting at Knoxville of East Tennessee Home-Makers and found them actively engaged in improving their homes and asserting their right to the best in life. With such leaders as Mrs. J. A. Reagan, Mrs. C. O. Browder and Mrs. W. B. Stokely they will put us on our mettle in perfecting the gentle art of home-making.

To most of us this coming together has been accomplished under difficulties, and I trust each delegate will feel the sacrifice has been duly rewarded. I am a country woman and can realize fully all the obstacles in your way. Women are largely responsible for the movement away from the farm, and I believe they are going to swing the pendulum back again. Now that the wise writers have so clearly defined efficiency, the domestic science teachers have taught us to use labor-saving inventions, pointing out the easier, better way, the call to the farm will be heard and answered.

The old farm-house will be inhabited again by a home-maker who sees its possibilities. There will be some hardships to endure, some difficulties to overcome, yet the reward is great—a purer womanhood, a nobler manhood. Can life be spent in a better cause? To me it seems the best.

In the absence of Mrs. J. H. May, Mrs. Tidwell, of Pulaski, read her paper, "Economy in the Home Life."

ECONOMY IN THE HOME LIFE.

By MRS. J. H. MAY, PULASKI.

Mr. Webster tells us that economy is the regulation of household affairs—frugality in expenditures. Then economy in the home life signifies to me the management, with care and the regulation, of all our home affairs.

Christ, our first teacher, gave us a most valuable lesson in economy when he fed the five thousand. In the very preparation of the banquet in the wilderness he teaches us to make the provisions at hand serve the present need. What his disciples had considered altogether insufficient he makes to be *more* than sufficient; and when the repast is finished a full meal has been served every guest out of the little supply, and there still remains a great pile of food.

Now Jesus teaches another great, important lesson. The Lord instructs his disciples to gather the remaining food in their wallets. Waste and prodigality often follow in the wake of God's abundant blessings; we understand the meaning neither of poverty nor wealth. God's lavishness is not waste, except we make it such. The abundance of one day, or week, or year must not make us spendthrifts but economical and provident stewards of the goods he has bestowed upon us.

We should not only economize our expenses but also our time and labor. I believe in concentrating work when I can, but I am not prepared to dictate to others the best methods for their concentration. I confess to a sympathy for the woman who when asked why she did not make her head save her heels, replied that her head was worth so much more than her heels that she thought it extravagance to waste brains on her feet. If all women had *strength* to carry out a *system* of work that spells efficiency, there would be more cause for fault-finding with those who deflect from this line. One fact that the advocates of efficiency as a cult lose sight of is that the object of a home is not to achieve a piece of perfectly working machinery but to give peace and happiness to those within its borders. The woman who runs a big establishment, who deposes her work as housewife to hirelings, who is absorbed in other objects to the exclusion of home-making, may require missionaries to show her how to find the leaks in her kitchen. On the other hand, the woman of moderate means who enthrones her home, where it belongs, as the prime consideration of her thoughts, is the mistress of an efficiency in management, in economy of money and labor, that would, if possessed by a man and applied by him to business, put him at the head of his class as a Napoleon of industry and of finance.

In all and after all life is what you make it. Said a bucket to his companion as they were going to the well, "How very dismal you look." "Ah!" replied the other, "I was reflecting on the uselessness of our being filled, for let us go away ever so full, we always come back empty." "Dear me! how strange to look at it in that way, for it matters not how often or how empty we come we always go away full; only look at it in that way and you will always be as happy as I am." Now this is a simple homely illustration, but it speaks volumes as far as right living is concerned. It would be hard to find a single paragraph which contains a more indisputable truth than the following by Prentice Mulford: "People ruled by mood of gloom attract to them gloomy things." The hopeful and cheerful attract the elements of success. A woman's front or back yard will advertise that woman's ruling mood in the way it is kept. A woman at home shows her state of mind in her dress. Rags, tatters and dirt are always in the mind before on the body. Every thought of yours has a literal value to you. In whatever mood you set your mind does your spirit receive of unseen substance in correspondence with that mood.

To look for the best in all people and all things puts us then on the direct line of finding what we are looking for. The same rule applies to our homes. If we take our home duties as a drudgery, forever bewailing our fate in having such a hard time and so much to do, we lack that sustaining power or force that is necessary to carry on a successful household. As life is what we make it, so is the home. I am sure that at times most of us feel that our home duties are very heavy on us, but is it really the duties or the frame of mind that we have towards them? The only real happy life is the busy life, and when we have a well-regulated home and have learned to economize our time and talent, making our work a pleasure and not drudgery, then we will shape to our own advantage the ordinary circumstances of life instead of being shaped or deter-

"A servant with this clause
Makes drudgery divine;
Who sweeps a room as for thy laws,
Makes that and the action fine."

I read this letter the other day from a woman in the far West:

"It is the drudgery of life that seems to me the awful, killing thing. It is all very well for you to talk of high and ideal things. Sometimes I think you forget there are rooms to be swept, bread to be baked. I drudge, drudge, drudge from morning till night. Of course I have a perfectly clean house to show for it, but I am so worn and tired that I fairly drop into bed, and I look nearly twice my age. After a good many years of this I haven't much spirit left. What time have I for the ideal?"

Ah, how we blame the daily and the commonplace when it is we ourselves who are at fault! We think if we bake daily bread for the body it is enough. We would be ashamed to have our households sit down hungry to a table where there was nothing to eat, yet the higher and better part of us we do without shame allow to go starved and weak for lack of food. We clean the rooms where the body is to dwell, and are embarrassed enough if our neighbors find dust on our mantelpieces, yet we allow the chambers of the spirit to remain dark and the abode of the spirit to become worn and unlovely, and we lay the blame not on ourselves but on the commonplace.

But, God be thanked, none of our own mistakes alter the noble daily facts of life. If I wear out my youth and strength in a pitiful, unthinking drudgery, with no food for the hungry spirit, with never a look at the stars, never a pause to listen to life itself—yet life, thank heaven, is not dwarfed thereby. It still flows on, glorious and ample. The stars still shine whether I look at them or not. Ample the tides flow around me. In the midst of all drudgeries and unloveliness that are foes to the spirit the Lord still "prepareth a table before me in the presence of mine enemies." It is we only who forget to taste the food

"All service is the same with God—

With God, whose puppets, best and worst,

Are we, there is no first nor last."

Vast amount of pleasures are escaping us because we take too limited a view of life. We give almost our entire time and attention to the rounds of daily petty details and in this way we allow ourselves to become so absorbed and enslaved, and even annoyed by them sometimes, that we become engulfed in that dead sea of monotony that makes us mad. We concern ourselves daily and we bother about things that get us into actual ruts of thought of work and of habit. It is for this very reason that the occasional trip away from home, away from those with whom we are in daily contact, the members of our own household, is of great value. To come in contact with new scenes and people gives a change which becomes a rest and we return to our homes and the duties of daily life with a freshness of spirit and a new angle of vision that cannot help lifting the life to a higher level. We American people are prone to take our work or business so seriously and to get so thoroughly in harness, as we say, that we do not take the time for pleasures that we could enjoy and could give also to those in more immediate contact with us. To mingle your pleasures with your work as you go along is unquestionably the part of the wise, but by all means do not sour on your work. This brings to my mind the prayer of Mrs. Wiggs: "*Oh Lord! whatsoever comes keep me from gitting sour.*"

Friends, put all your worries in the bottom of your heart, then sit on the lid and smile. If you have known little to make you glad, just square your shoulders

and resolve to swim up stream into more wholesome surroundings and make the flowers grow in your home life where only weeds were rank before.

Mrs. Pearl Williams Kelley spoke of the generous aid the State will give any school in buying a permanent library. The members of a Home-Makers' Association might well help a school to raise a goodly sum for this purpose, and Mrs. Kelley will gladly give all the aid possible to any community.

Miss Virginia Moore suggested that the Peabody Faculty would be pleased to have as many of the delegates as could visit the school in session. It was suggested that Miss Moore would chaperon a party at the close of the afternoon session. Fifty women expressed a desire to go.

Mrs. C. W. Baker invited the delegates and their friends to visit Carnegie Library to study the exhibit for the Prevention of Blindness and the Preservation of the Public Health.

Col. Tomlinson, Assistant Commissioner of Agriculture for Middle Tennessee, was introduced and spoke along the line of the wonderful interest in farm life today and the effort being made to keep the boys and girls there on the farm by making the surroundings attractive.

Miss Agnes Marston spoke briefly on what the Tomato Club work had meant to her. Miss Agnes showed very clearly that the club work was helping her to tell what she had aimed to do and what she had accomplished, as well as where she had fallen short.

Reports from local clubs were called for to cheer us in the work. Mrs. James Grizzell told of the story club for the children carried on in connection with the older women's meetings. A school club had somewhat interfered with this, but the children were so eager for the reopening of the hour that it will soon be undertaken. This club is near McMinnville.

Mrs. Harris told of the good work accomplished by thirteen women in a club near Prospect. These women have been the means of getting a new and attractive little school house.

Mrs. Schubert, of Hohenwald, reported a very new club with five members that gave promise of great good for the community.

Miss Madge Farrar was then introduced and spoke on "How I Grew My Garden." This was a treat.

HOW I GREW MY TOMATO PATCH.

BY MISS MADGE FARRAR.

A little more than a week ago Miss Moore asked me to tell you "How I Made My Tomato Crop." It being an entirely new experience, I hesitated, but after considering the matter I decided to adopt our club motto. I told her I would try. But in the press of school duties and canning I have scarcely had time to review the work done.

Tennyson's experience must have been similar to mine when he said:

"And I must work thro' months of toil
And years of cultivation,
Upon my proper patch of soil
To grow my own plantation.
I'll take the showers as they fall,
I will not vex my bosom;
Enough, if at the end of all
A little garden blossom."

I first got my desire to join the "Tomato Club" by reading in the papers what other girls were doing, and as I loved gardening and am naturally fond of outdoor life, I thought if others were doing so much, why couldn't I?

So, early in the year 1913 I told my teacher to send in my name. At that time I did not know Mrs. Hardin, the county colaborator, who so earnestly and faithfully works with me.

We have no school club, but she takes a personal interest in each one of us and is constantly urging and encouraging us.

Judge Houston was visiting our home and learned of my intention to be a Tomato Club girl and told me to go ahead, it was a fine work, and he would help me if he could. He sent me seed and literature, which was the first recognition I got.

Papa had an old orchard cleared up, and when we went to select my plat we decided on a rich, level place in the lower end of the orchard and laid off a plat 66 feet square.

I had the land turned, cross broke, disked and smooth harrowed and left to freeze, and worked it several times that way. I believe in thorough cultivation before planting; it stands the drouth better, and I've had that to contend with to a very great extent.

Later I laid off deep furrows, five and one-half feet apart, and filled with stable manure, which took two wagon loads. Threw two furrows on this and let lay until time to plant, which was about the first of May.

I mulched all my slips before planting and tried to plant when there was a season in the ground, but as I was a bare-footed girl I did not get any mud on my shoes.

I got my patch set out about the last of May. Some had died, so I had to replant; still I did not get my shoes muddy. I planted about three feet apart in rows, and cultivated with a V cultivator every week until time to stake them. I hoed them every two weeks through my crop, until they were too rank, and then kept the weeds pulled out.

I mixed with the dirt in each hill a tablespoonful of nitrate of soda.

My first blooms appeared about June 10. My first ripe fruit July 7.

I staked some, put straw under some and brush under the others. Those that had brush under them stood the drouth better than the others and yielded more fruit. The staked ones next. I do not advise the use of straw. I had my stakes seven feet high, and pruned the vine. The fruit was some larger than the other, but no better.

One bush with brush under it was the first to bear and the last to quit. I gathered three bushels or more off that bush.

I gathered them every day, and when I started to school I would get up early and gather them before school hours and can after school, and you bet it kept me hustling. I gathered 3,300 pounds from one-tenth of an acre. My expenses were \$24.00, allowing myself ten cents per hour for work done. I sold my crop and cans for \$90.00, thus my profits were \$66.00.

I won first county prize, a thorough-bred Jersey pig, which now has seven little ones; second one booklet, one-half dozen photographs; and a special prize at Knoxville consisting of a crate of onyxware.

The club has meant to me very much. I have gotten ideals of life which I would have missed otherwise. It has created in me a desire to do what I do a little better than anyone and get more out of it than the other fellow. It has taught me to keep my accounts honestly and accurately, how to raise and can vegetables, and it was such interesting work from the time I planted my seed till the canning was over. It is also attractive from a financial standpoint; any twelve-year-old girl can earn all her spending money at home. Out of my profits I bought a mule colt, my canner and cans for this year.

The trips I've gotten through the kindness of the railroad officials have been a great help to me, and the association we get with Miss Moore is well worth being a Tomato Club girl.

Capt. T. F. Peck was escorted to the front to speak to this large number of interested women. He spoke very briefly but to the point, as usual. He said that he was more interested in the spread of this organization than he could express. He was willing to help it in any way possible and because he knew that money was a great necessity he put all the financial affairs of the organization in the hands of its officers for all time and made them responsible for its wise use.

Mrs. H. A. English made a brief report of her trip on the Agricultural Train, telling how she entertained and instructed the women at the various stops, and how eager they were to hear all she had the time to say. She also made a report of the wonderful work done by the Pulaski club.

At this point Mrs. Guilford Dudley, President of the State Equal Suffrage Association, was introduced and spoke very clearly and convincingly of the need and the good results to be obtained by the equal right of men and women at the polls as voters, citizens of a common country.

The session adjourned to meet at 10 o'clock October 7.

SECOND DAY—WEDNESDAY, OCTOBER 7, 1914.

MORNING SESSION.

The President called the meeting to order and introduced Mr. Eli Haggard, lecturer and author of "The Country Boy," who led in prayer.

Miss Mary Skeffington was introduced and spoke at some length of the workings of the various departments of the Tennessee State Library. She said that it was possible for a club to get a good library for circulation in any town, village or community in the State by making application to the Librarian, and that often clubs could get special books for study through the State Library.

Mrs. Bettie Lyle Wilson, known all over the land for her wonderful decorated cakes and for her ability as a teacher of cooking, was presented to the association. Before beginning her demonstration of "A Farm Dinner" she made a little talk on the good to be accomplished by such lessons and demonstrations.

Mrs. Wilson gave many helpful recipes as she went along and was most willing to be questioned as to how she did the work she was showing. All were charmed with the beauty of her dishes as well as with their simplicity and economy.

While Mrs. Wilson was decorating the Home-Makers' cake with pumpkins and chrysanthemums and preparing to cut it, Mrs. Rose Nipher gave her report of her share of the Agricultural Train trip.

When the cake had been served the meeting adjourned till 1:30 p. m.

AFTERNOON SESSION.

The special business of the afternoon session was the election of officers. Nominations were made from the floor and all delegates took a part in the proceedings.

Mrs. Clara Boone Mason, of Prospect, Giles County, was nominated for President. There being no other nominations, Mrs. Mason was elected by acclamation.

Mrs. J. L. Walker, of Wartrace, Bedford County, was nominated for re-election as Vice-President. There being no opposition, Mrs. Walker was elected by acclamation.

It was moved and seconded that the Constitution be amended so that Article 4 shall read: "Consisting of a President, Vice-President, Secretary and Treasurer, and three other members," etc.

The Secretary was called on to read the constitution to see if this could be done without a previous notice. It was seen that it could be, provided a unanimous vote of the members present so decided. The motion carried unanimously.

Mrs. Myra A. Tandy, of Davidson County, was elected Secretary.

Mrs. W. C. Jones, of Huntland, Franklin County, was unanimously elected Treasurer.

Because of the election of Mrs. Jones as an official and the expiration of the term of office of two other members on the Executive Committee, it was necessary to elect three new members.

Mrs. Hugh A. English was elected to succeed Mrs. Chas. H. Slack, and Mrs. J. Taylor Stratton to succeed Mrs. T. G. Settle, for a term of three years, and Mrs. J. M. Cunningham was elected to succeed Mrs. Jones for the two years of her unfinished term.

It was moved by Mrs. Jones and seconded by Mrs. English that the Executive Committee of the association confer with the State Department of Agriculture regarding the granting of passes to the Home-Makers' Section meetings so that the women who are interested and will attend the meetings shall be the ones to get the favors. Carried unanimously.

Roll call showed that many who were present the first day were not there for the second and that many new ones had come in for the first time that day.

Mrs. Chas. W. Baker conducted a Round Table Love Feast in which nearly every woman present took part. There were short cuts in house-keeping and sewing suggested, recipes for new dishes, directions for canning hints and helps in many directions and expressions of gratification for the interesting things brought out by the hour.

Announcement was made that Miss Moore would take the Tomato Club girls to the picture show.

The session adjourned till 10 o'clock Thursday morning.

THIRD DAY—THURSDAY, OCTOBER 8, 1914.

MORNING SESSION.

The President called the association to order at 10 o'clock. Mrs. Rose Nipher opened the session with prayer.

Dr. Lillian Johnson, of Memphis, was introduced. She spoke most entertainingly of the new interest in country life. Dr. Johnson is working with the rural life committees of three organizations and is always ready to answer every call for help from any place. She told of the community life in the Old World countries that she had visited and suggested that we in America might, with profit, adopt some of the features of these nations. She showed the need and the result of closer cooperation between women in the country and between the women of country and town.

The speaker called the attention of the women to the fact that the United States Department of Agriculture, Department of Education and the Bureau of Child Welfare are already waiting to send for a postage stamp a list of bulletins for the use of the women of the country.

Dr. Karey Davis, of the Seaman A. Knapp School of Country Life and the George Peabody College for Teachers, spoke on the subject of "Sanitation and Household Helps for the Farm." An effort will be made to have this paper printed for distribution to the clubs of the section. Dr. Davis' paper follows:

SANITARY CONVENIENCES FOR THE RURAL HOME.

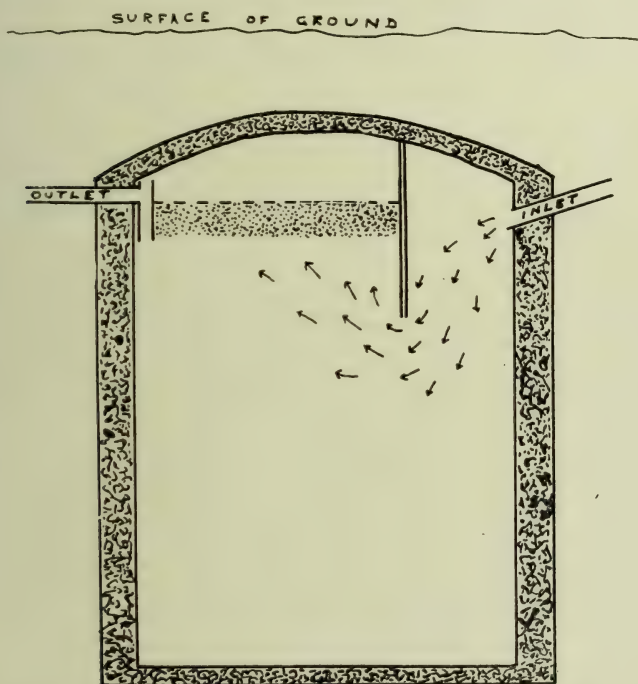
BY DR. K. C. DAVIS, KNAPP SCHOOL OF COUNTRY LIFE.

If we are to cause boys and girls and indeed older people to be contented with rural life and make them satisfied to live continually upon the farm, we must give attention to home conveniences. The home must be as comfortable as a city home, and it can be made so with very little trouble or expense. Farmers who have laid by a little for their last years of life are often found to leave the farm, chiefly because of the conveniences and comforts of the modern city home. They fail to realize that with much less expense than in the city they could equip their own country home with such comforts. If this equipment is provided long before retirement is possible the advantages are far greater. Young members of the family will be much less likely to be discontented with their rural surroundings. Indeed the comforts of life are many—things which we all consciously or unconsciously crave. We cannot blame boys and girls for wanting to leave the surroundings which we frequently find on the farm premises.

A convenient water supply will save hours, days, months, even years of disagreeable drudgery for the housewife, the water boy, and other members of the family.

Circumstances differ so widely that it is difficult to give any definite rule or instruction that can be closely followed in providing a water supply for the home, the barn, and the milk-house. The use of a hydraulic ram is possible wherever there are springs or streams having a swift current and showing a decided fall in water level of two feet or more within a reasonable distance. Such a ram is inexpensive—\$6.00 will buy one. The amount of pipe required will depend upon the location of the stream with reference to the farm buildings.

Other means of forcing water to the buildings are commonly known. The one or two-horsepower gasoline engine, the windmill, the electric motor, the water wheel, the hand pump, the tread power—all are in use in various places.



Vertical section through septic tank for private home yard, about six feet deep and four feet in diameter. The walls are of concrete and the pipes of four-inch tile. The outlet screen is a common T-joint of sewer pipe. The baffle board in front of the inlet pipe reaches one foot below the level of the liquid.

The water tank is one essential feature of a good water supply. This tank, if possible, should be in the ground. If there is a hill near the buildings, dig a little cistern in that and let it be the water tank. The pipe from the ram or other power can send the water to this cistern in the hill and from there it can flow back to the kitchen, bathroom, barn, the trough where cans of milk are stored, or elsewhere.

The pneumatic tank in the ground is also satisfactory. It must be strong, and is, therefore, a little more expensive than other tanks. Wooden and metal tanks elevated from the barn or placed in the windmill tower, or at any other suitable elevation, are too commonly seen to need mention here.

SEPTIC TANK.

Probably the most important element in making the conveniences of the country home satisfactory is the use of a septic tank. Many mistakes are made in building such tanks. Several particulars in their construction should be enumerated here.

1. The underground tank must be dark and air-tight.
2. It must be so constructed as to not empty itself by syphoning.
3. The inflow pipe must be so shielded with a baffle board or dam as to prevent agitation of the top mass in the septic tank.
4. The outlet must be so constructed as to prevent drawing off this top floating mass, because it is in this mass that the beneficial bacteria are doing their work.

The septic tank may be placed as near the house as desired, but it should not be under it. It is better to put it on the opposite side of the house from the well, and let the overflow or drainage pipe from it extend in a direction away from the well. It must be understood in draining the tank that the water taken away is clear and practically pure, but safety would require us to use the water for irrigating the lawn, roses, shrubbery, fruit trees, etc., rather than let it run toward the well. Such water is really pure enough for stock to drink if the overflow is conducted to a stream for that purpose. Most of the water may disappear in the ground as it runs along through a porous outlet pipe, for example, one constructed of land tile or other open pipes.

The drawing shows the vertical section of the tank, the inflow pipe, and the drain pipe.

Papers left over from the day before were read at this time: "Organized Home-Makers of the District," by Miss Elizabeth Abernathy, of Pulaski; "Organized Home-Makers of the City," by Mrs. H. T. Campbell, of Nashville; and "Organized Country Home-Makers," by Mrs. H. A. English, of Pulaski. These papers follow:

ORGANIZED HOME-MAKERS OF A COUNTRY NEIGHBORHOOD.

BY ELIZABETH DENTY ABERNATHY.

The New York Globe says: "The parcels post which it was believed would develop into an important factor in reducing the cost of living as far as farm produce is concerned, has proved to be a miserable disappointment."

A disappointment to many, perhaps, who expected immediate results, forgetting that it takes a triple alliance of Uncle Sam, producer and consumer to make parcels post service effective.

Uncle Sam has provided ways of transportation and is ready to do more; but he can help us only as we make an effort to help ourselves. It is time for producer and consumer to get busy.

Farmer folk have much to learn before they can begin to ship their commodities to city consumers. Then they have been told of their ignorance and shiftlessness until they have almost lost faith in their powers of initiative.

The New York Globe says further: "The failure of the parcels post to come up to expectations is due entirely to the greed of the farmer, who cannot resist the temptation to ask prospective customers prices for his produce far above those current in his own locality and higher even than those exacted by the fancy retail stores of the cities for produce of the same grade." Poor old farmer! He catches it going and coming, doesn't he?

The enterprising farmer who can put his staples upon the city market in good shape expects and deserves city prices. The parcels post and lowered express rates will, eventually, reduce city retail prices; but until large numbers of country people are engaged in direct marketing it is useless to expect radical changes.

Don't browbeat us for greed and stupidity. Give us time to work out our problems of standards and containers. Work with us. We need your help.

To my mind, the parcels post heralds the dawn of a new day, in which city people and country people shall work together and understand each other as they have never done in the past. It is the privilege of organized home-makers to play the leading part in helping Uncle Sam to establish the intelligent, sympathetic cooperation of city women and farm women.

In her isolated home on the farm it is no easy task for one woman to standardize her commodities, procure suitable containers, and find reliable city customers. That all of these difficulties may be overcome when the women of a country neighborhood come together to work out these problems has been demonstrated by a little band of farm women in Giles County.

Let me tell you briefly the story of our Pleasant Valley Ladies' Aid Society. Because farm women are too busy to attend clubs of various kinds, and because we feel that the church should take the lead in every movement for community betterment, our organization developed into a club of diversified interests and activities. We have a domestic or home-makers' department, through which, aided by Uncle Sam and city friends who wanted our butter and eggs, we have built up trade with groups of consumers in various cities. Last year our sales amounted to more than \$2,000.00.

Fortunately for us, one member of our society had learned in some way to apply to Uncle Sam for guidance in business matters. As we were organized, every other woman heard of farmers' bulletins and their possibilities. Some of our members made good butter. As we were organized, every woman among us had a chance to taste this butter and to learn how it was made. The bulletins helped us all to make better butter. Uncle Sam told us where we could get creamery supplies. Because we were organized, it was possible to order these supplies cooperatively, thus saving the expense of individual orders. As we were organized, the women who had friends in the city made engagements that called for all the butter and eggs of standard requirements our community could furnish.

A movement worth while? Our customers think so. They write:

"The eggs are so fresh it is a joy to break them." "Your butter spoils us for the kind we can get in the city."

Worth while? We have found it so. A tenant woman of our community sold over \$200 worth of butter and eggs last year. This year one member of our club has sold \$150 worth of butter, another \$200 worth, and a third \$1,000 worth.

Worth while? Uncle Sam thinks so. He says:

"You have done a marvelous work. It is just such cooperation that makes it possible for the department to do its best work."

Organized home-makers—Uncle Sam's cooperators. I like this alliance. Don't you?

ORGANIZED HOME-MAKERS OF A CITY NEIGHBORHOOD.

BY MRS. H. T. CAMPBELL.

Nearly two years ago I was a guest in the home of the President of the Pleasant Valley Ladies' Aid Society, of which you have just heard. She asked me if I would like to dispose of a case of eggs for the society during the holidays when eggs are always in demand and the price is good. I told her I would be glad to do it, and felt sure I could handle a case at this time. However, there was some delay in getting the case packed and shipped, and it did not reach me until after New Year.

I shall never forget how beautiful those eggs looked when I opened the case—so clean and fresh looking, and so uniform in size; but when I remembered there were thirty dozen of them I wondered if I had not undertaken more than I could do.

I immediately started out to see my neighbors, told them the history of these eggs, and before I had spoken to one-half of the housekeepers in my own block all the eggs were sold in lots of one to five dozen. Eggs were then selling at 30 cents per dozen. The following day I was able to send a check to the President of the society and to ask her to send me a case of eggs every week, for each of the ladies who had taken eggs said she would take the same number every week and would pay the grocery price.

In a short time housekeepers living on other streets became interested in getting these eggs, and I had to ask that two cases be sent me every other week, and then two cases each week were needed to supply the demand.

The society then became interested in finding a market for butter, and I engaged the butter as I had engaged the eggs, getting 30 cents per pound from May 1 to November 1, and 35 cents per pound during the remaining six months of the year. Parties who had autos would come a number of blocks for butter and eggs, and would take back supplies for their neighbors.

Butter in cartons is easy to handle. The President, who packed the butter, put on each carton a certain letter or figure which indicated to her the party who had made the butter. When there was any complaint I reported to the President, giving the symbol upon the carton. She knew at once whose butter had not come up to the standard. The President assumed all responsibility for bad butter and bad or broken eggs, and always made the loss good.

I do not know to what proportions the business might have grown if I had

a private telephone, but I could not allow too many calls for butter and eggs over a physician's telephone.

A lady living several blocks from me began to handle a case of eggs each week, and the society soon had engagements for butter and eggs in St. Louis, Memphis, Decatur, Birmingham and Montgomery.

The cases came to me on Tuesday, and I devoted that day to receiving them and distributing their contents. In fifteen months I sent the society checks for \$661.89. That was the amount of sales with expressage and a commission of 10 per cent deducted.

Last spring I moved to a distant part of the city and the engagement passed into the hands of one of my neighbors. During the three months she has held it she has sold over \$200 worth of butter and eggs.

The enterprise which started in a missionary spirit was soon established on a business basis. These women had their hands too full with their butter and egg engagements to supply their customers with everything wanted. They have had calls for chickens, turkeys, ducklings, dried fruits, fruits for preserving, hams, sausage, cottage cheese and cracklings.

ORGANIZED HOME-MAKERS OF THE COUNTY.

By MRS. H. A. ENGLISH.

Ladies, to tell of the Home-Makers' Club is to tell of old-fashioned ideas clad in new fashioned methods. The home is undoubtedly the woman's province, and she who looketh well to the ways of her household and eateth not of the bread of idleness is indeed a home-maker in every sense of the word.

The first home-makers' club was organized in Nashville in 1911 under the auspices of the Farmers' Institute. The purpose of this club is, as stated in Article 11 of the Constitution, to unify the housekeepers of Tennessee in an effort to benefit their own home conditions; to help future homes by encouraging the introduction of home economics in all the schools of the State, and to cooperate with other organizations working to the same end.

We have in several counties of the Middle Tennessee division home-makers' clubs. In Giles County we have a club with forty members. It was my pleasure to travel for two weeks with the "Flying Farmer" in interest of the home-makers' club work, and as our Giles County organization had started a campaign for better butter and eggs, I took with me butter molds, parchment, cartons and shipping boxes, and told the ladies what we were doing or planning to do in Giles.

The interest manifested in the home-makers' organization bespeaks a better day for Tennessee. If we hope to reach the farm woman in her home, remote from town or village, we must study her needs from her point of view. We must follow in her lead. The Pleasant Valley women have worked out a plan that has interested every thinking man and woman in the country, other neighborhoods in the county have taken up the work, other counties in Tennessee and other States of the South.

The need of one rural community is the need of the South. What better work can county and State organizations engage in just now than in helping farm women to work out the problems that seem to them of prime importance.

Let us one and all enter a campaign for better butter and eggs and better ways of marketing them. Later we can ask the farm women to help us work out some of the problems that seem greater to us than the butter and egg problem.

But then the butter and egg problem is a city problem, too, is it not? Well, farm problem or city problem, let's work it out with Uncle Sam's help. Let's make Uncle Sam the middleman in our butter and egg business. Why not ask him to plan the campaign and let us all, farm women and city women, cooperate with him. Organized home-makers, Uncle Sam's cooperation, and as Miss Abernathy calls us a triple alliance of consumer, producer and Uncle Sam.

Let us wage war on bad eggs, bitter butter and the high cost of living, a triple entente.

It was moved and seconded that the President appoint a committee of three to appear before the coming session of the Legislature to urge a liberal appropriation by the State under the offer of the National Smith-Lever Bill for the carrying on of the work among women in this State. Carried.

The President appointed Mrs. Rose Nipher, of Davidson County; Mrs. Jones, of Franklin County; and Mrs. Stratton, of Davidson County.

Mrs. Paul Seavy, of Lawrence County; Mrs. J. M. Cunningham, of Warren County; and Mrs. Rose Nipher, of Davidson County, were appointed a Committee on Resolutions.

The matter of getting out a new handbook and a series of leaflets was left to the Executive Committee, as was the appointing of County Chairmen.

The Resolutions Committee reported the following, which was unanimously adopted:

RESOLUTIONS.

Your Committee on Resolutions beg leave to submit the following:

Fully realizing the importance of this great movement to the country women, and feeling that this is by far the best meeting that has been held; therefore, be it

Resolved, That we extend to Captain T. F. Peck, to the other officials in the Department of Agriculture and to the railroads our sincere thanks for their interest and help in making this great meeting possible.

That we also thank the many women who gave so freely of their time and thought and interest and took such active part in the deliberations.

That we thank Capt. Peck and Col. Tomlinson for their words of encouragement and cheer which mean so much for the spread of the work.

That we express our appreciation to Dr. Davis, who took his time to come and speak to us on the important subject of Sanitation and Household Helps.

That we thank Mrs. Dudley and Dr. Johnson for being interested enough to come to us in our meetings and speak to us so well.

That we gratefully acknowledge our indebtedness to Mrs. Kelley and Miss

Skeffington for their promised aid in the matter of libraries and books for study in our local clubs.

That we thank the Phillips & Buttorff Company for their kindness in sending the grafonola and music out for our entertainment.

That we thank the Tomato Club girls for their work as pages all through the sessions, assisting Mrs. Wilson so nicely in her demonstration, which was so valuable to us.

That we extend to Mrs. Stratton our appreciation for her thoughtfulness in presenting the Association the gavel wielded so gracefully by our President.

That we give unbounded praise and gratitude to the women who gave so generously of their time, strength and thought on the agricultural train for seven weeks.

And last of all that we give to our officers, who have served faithfully through this year of hardship, a large portion of thanks for their energy and devotion, not forgetting, too, the many women in the ranks who have made sacrifices for the advancement of the home-makers' ideal in country, village and town.

Respectfully submitted,

MR. J. M. CUNNINGHAM.

MRS. EDNA SEAVY.

MRS. ROSE NIPHER.

The Secretary was asked by the President to conduct a mock organization of a Home-Makers' Club so that the women might feel better prepared to go home and start the work at once. It was an inspiration to see that all the women were ready and willing to forget timidity and enter into the real work of the organization as though it were in earnest. The arguments presented for and against the organization of such a club were the real things that will be met by each woman in her work and the replies made by the women themselves showed that they were fully able to meet all opposition.

The association adjourned after adopting a motion that all other necessary business be left to the Executive Committee to finish.

CATTLE RAISING PROBLEMS.

A carload of Billings, Mont., steers was recently sold to a Portland, Ore., packing house for nearly \$18,000 net. The steers averaged about 1,400 pounds in weight, and the price received was approximately 6 cents per pound. That means that each animal sold for about \$85. This is a tremendous price to pay for cattle on the hoof. One can imagine what the steaks will come to when they reach the consumer after passing through the business of the middleman.

Report from Billings is that feeding is being carried on on a somewhat extensive scale in that section of the country this winter. The owners of the carload of cattle referred to above say it cost them about \$20 to fatten each steer. Fattening the cattle usually takes

100 days, the owners assert. Taken from the range the good steers cost from \$50 to 55. Feeding brings the cost up to \$75, leaving an estimated net profit of \$10 per head. The cattle were fed on alfalfa and beet pulp and refuse molasses obtained from a sugar plant at Billings.

The cost of feeding cattle since the cattle ranges have been broken up in this country has undoubtedly been increased. Grass-fed cattle, while inferior to well-fed cattle, aided greatly in days past in holding down the price of meats, the packers claim, and there is an element of truth in the claim.

Therefore, if we attempt to lower the cost of meats by more extensive cattle raising, we will have to increase the production of provender in a corresponding degree, for the demand for the latter will make feeding more expensive.

The only solution of the problem that we can see is for the farmers of the country to correspondingly increase the production of feed-stuffs and cattle.

The South is the only section of the United States where cottonseed meal is produced. Mixed for feeding purposes, it is the greatest fat-producing provender in the world. The soils of the South are also admirably adapted for extensive corn culture. The bran from corn, mixed with cottonseed meal, makes an ideal cattle food, and although cottonseed meal is expensive, mixed with bran, which now is much cheaper, it can be fed to cattle at a profit to the feeder.

The South should produce more cattle when we consider this great advantage. It would not only be profitable for the farmers to engage in this industry, but the increased production of cattle would aid in reducing the high prices of meats.—*Memphis News-Scimitar*.

TENNESSEE SOILS AND THEIR LIME REQUIREMENTS.

Origin of soil. 1. Dolomite. Soil description. Gravelly loams. Ridge lands as a rule very gravelly. Color of soil variable, commonly gray or light red, occasionally a rather deep red. Subsoil a red clay. Notes on the lime requirements. Chemical analyses show a low content of lime. In field trials the fields of clovers and alfalfa have been markedly increased by liming; also common crops were benefited.

2. Slate or shale. Silt loams inclined to be shallow and "crawfishy." Color of soil variable, commonly gray or grayish-yellow, with yellow or reddish-yellow subsoil. Often forms valley lands of inferior fertility. Chemical analyses show a low content of lime. These soils

are derived from slates and shales of different formations and vary greatly in character. In the limited number of field trials made, liming has given marked increases in yields of clover, cowpeas, etc.

3. Chickamauga limestone ("rotten," or "blue," limestone). Silt loams to clays. Heavy soils, grayish and reddish-yellow in color, with reddish-yellow subsoil. New lands sometimes show a fair lime content. Old lands are apt to be poor in lime. In field experiments on old land an application either of 1 ton of burnt lime or 2 tons of ground limestone per acre proved very profitable.

4. Marble and other limestones producing dark red or mulatto soils. Loamy soils distinguished by their rark red color. These soils are much more apt to be well supplied with lime than any other upland type in East Tennessee. Liming is advisable for alfalfa and may be profitable, especially on old fields, for other crops.

5. Alluvial deposits. Sandy, fine sandy loams, silt loams, etc. Lime supply apt to be at least fairly good. A fertile fine sandy loam at the station farm was found to respond profitably to liming, especially for clovers and alfalfa. See Table III.

CUMBERLAND PLATEAU.

Walden sandstone. Fine sandy loams, occasionally silt loams and sandy soils. Content of lime very low. Liming essential to best results in soil upbuilding, but should not be excessive—say 1,000 to 2,000 pounds of burnt lime per acre; but a larger quantity of ground limestone may be applied to advantage—two tons per acre.

HIGHLAND RIM.

1. Blue limestone, etc. Heavy silt loams of dark red ("mulatto") color, with heavy red-colored subsoils. Also gray and brown colored light silt loams with red subsoils. Soils apt to be low in lime. In numerous field experiments liming has been found to be necessary in order to get alfalfa; also yields of clover and cowpeas markedly increased. Liming not always profitable for either peanuts or tobacco.

2. Siliceous limestone. Light silt loams of grayish color, with either reddish or yellowish subsoils—the "Barren" type. Chemical analysis shows very low content of lime, but these soils do not always respond with much profit to liming. Liming is recommended, however, and should be considered as a necessity in permanent soil upbuilding. Applications should be moderate in quantity, as in advice for Cumberland Plateau soils.

CENTRAL BASIN.

Blue limestone, etc. Brown colored silt loams, with brownish or yellowish-red subsoils. Also grayish soils, with yellowish-red subsoils and in the vicinity of Murfreesboro red-colored soils, with red subsoils. These soils analyze the highest in lime of all the soils in the State. Clover is grown more successfully than over any other large area in the State. In a few experiments, liming did not prove to be needed by alfalfa. In several other trials liming proved very beneficial to red clover, as well as to alfalfa.

WEST TENNESSEE.

Unconsolidated material poor in lime. Gray and brown-colored silt loams predominate. Subsoils red, yellowish-red, etc. The most fertile lands, such as are found in Obion county, are not apt to need lime, at least for clover. Old land on station farm at Jackson responds markedly to liming. Liming apt to be highly profitable over a large part of this section for all crops except cotton.

MAKE CAPONS OF THE COCKERELS.

The very best cockerels must be selected for capons. They should be good sized, vigorous. A large frame is necessary if much flesh is to be put upon it and in breeding for capons one should select a strain that matures as early as possible.

The capons must be kept growing every moment, and they should have a reasonably large range.

If confined too closely they are apt to become droopy and sick. While not particularly active they thrive better if they have a reasonably large run, and they seem to take on fat better.

Too many people make the mistake of waiting until within two weeks of marketing before fattening their birds. If they are to be sold in January they should be pushed at least six weeks to get the very best results. This will produce a large, fat capon that will bring a fancy price if packed in clean, white paper in a clean box.

A man who thought he was a pretty good farmer was getting about \$50 per month for his milk from his herd two years ago. He employed a young Hollander just over from the old country and in eighteen months he almost doubled the output.

It is the feed and not the breed which makes the table fowl par excellence.

CROP REPORT FOR OCTOBER.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., November 1, 1914.**

Correspondents from only seventy-four out of the ninety-six counties in the State reported to the Department on conditions for the crop month ending October 20.

Reports received indicate that crop conditions in the State are much better than reports earlier in the season indicated they would be.

The corn yield in the State as a whole will probably equal, if not exceed, three-fourths of an average crop.

October rains damaged corn and cotton to some extent, and also hay. However, a good crop of the latter was saved.

A larger acreage of wheat has been sown this year than for several years, the weather being very favorable for planting. There is also a larger acreage of oats and rye.

The yield of cotton will probably equal that of last year, which showed a very good crop.

Late Irish potatoes show a good production. Indications are that the yield of tobacco will show an increase over last year. Sorghum, broom corn and peanuts will also show an increased yield.

Young clover, grasses and alfalfa are in good condition.

The yield of apples will exceed that of 1913.

About two-thirds of the hog production had been marketed. The live stock of the State is in good condition.

The building of silos in the State is on the increase, and in this manner the farmers are conserving much of the feed value of their crops that had been allowed to go to waste.

Following is the summary for comparison of the reports of this Department for October, 1913 and 1914:

	Per Cent. 1913	Per Cent. 1914
Wheat, acreage sown.....	71	98
Winter oats, acreage sown	77	86
Rye, acreage sown.....	77	87
Corn, yield	59	71
Cotton, yield	65	82
Millet, seed threshed.....	56	78
Stock peas, seed threshed.....	57	68
Sweet potatoes, yield.....	67	85
Late Irish potatoes, yield.....	52	69
Tobacco, yield	74	84
Sorghum, yield	72	87
Broomcorn, yield	66	85
Peanuts, yield	69	83
Young clover, condition.....	64	72
Grasses, condition	69	81
Alfalfa, condition	81	85
Pea hay, saved.....	72	78
Apples, yield	43	75
Live stock, condition.....	86	89
Hogs, marketed	57	62

OCTOBER CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT.	COUNTY.																			
	Wheat—acreage sown.	Winter Oats—acreage sown.	Rye—acreage sown.	Corn—yield.	Cotton—yield.	Millet—seed threshed.	Stock Peas—seed threshed.	Sweet Potatoes—yield.	Late Irish Potatoes—yield.	Tobacco—yield.	Sorghum—yield.	Broom Corn—yield.	Peanuts—yield.	Young Clover—condition.	Grasses—condition.	Alfalfa—condition.	Pea Hay—saved.	Apples—yield.	Live Stock—condition.	Hogs—marketed.
A Mississippi River Section.	Lake	65	40	95	45	55	50	85	90	80	85	...	...	55	95	95	50	40	85	100
	Obion	...	...	...	...	...	...	40	45	...	40	90	...	40	75	20	20	50	80	60
	Dyer	...	...	...	...	...	...	80	80	...	90	...	...	90	90	100	40	100	100	...
	Laurens	100	100	100	65	65	30	50	50	90	90	...	...	100	90	40	60	95	...	...
	Shelby	...	...	75	35	45	20	75	80	80	...	...	...	85	80	75	60	20	90	...
B Upland Section of West Tennessee.	Weakley	90	100	100	65	70	25	85	55	80	65	...	85	45	45	55	20	20	85	35
	Gibson	100	100	100	80	80	90	95	100	...	85	...	...	95	95	95	70	80	90	20
	Crockett	...	...	50	60	65	90	50	50	...	75	...	...	25	75	90	90	...	85	...
	Madison	95	90	100	70	80	90	100	90	95	100	100	...	100	60	100	90	90	95	90
	Haywood	...	...	...	60	60	50	75	50	...	85	...	...	100	60	100	75	25	80	...
	Hardeman	100	100	100	70	80	50	75	100	...	80	90	90	75	80	75	70	65	80	80
	Kay	...	...	100	75	85	...	...	65	...	70	...	...	95	90	90	65	75	85	...
	Henry	...	...	100	95	95	...	...	85	80	85	85	...	70	85	...	80	75	85	...
	Carroll	50	100	100	...	...	...	...	100	100	75	90	95	100	50	50	100	75	10	60
	Henderson	100	100	75	...	...	...	...	100	100	100	100	100	...	55	65	50	100	...	...
	Chester	100	100	...	65	80	95	35	100	100	95	...	...	30	65	80	90	70	100	...
	McNairy	...	40	40	80	90	...	...	80	80	...	...	...	100	...	...	90	25	90	...
	Benton	...	...	...	70	75	75	30	...	...	100	100	...	...	...	100	...	...	65	40
	Decatur	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hardin	100	100	100	60	75	50	100	100	50	75	...	75	...	80
C Western Section of Middle Tennessee.	Perry	100	100	100	70	70	100	100	...	...	100	...	90	40	50	...	70	50	100	70
	Humphreys	...	95	80	100	70	...	...	60	95	70	...	85	80	90	...	45	35	95	20
	Houston	...	100	100	55	...	75	55	90	20	85	85	...	55	75	85	70	75	90	100
	Stewart	...	...	...	75	...	...	50	100	100	95	100	...	100	100	...	75	40	85	...
	Montgomery	100	80	90	90	...	90	90	...	100	80	...	...	90	90	100	100	90	75	...
	Robertson	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Cheatham	100	30	25	65	...	...	75	80	75	80	...	...	20	...	95	...	...	80	...
	Dickson	...	75	90	100	50	...	100	50	85	90	90	...	100	100	...	70	75	95	75
	Hickman	100	100	100	90	...	100	85	100	75	100	...	65	75	60	85	100	100	95	90
	Lewis	...	100	65	30	...	...	75	75	90	75	...	...	65	80	...	75	...	100	90
	Wayne	...	...	...	...	...	100	100	...	...	100	...	...	...	...	...	...	100	...	...
	Lawrence	...	100	100	65	100	...	...	90	90	...	95	50	75	35	75	...	80	65	55

D	Central Section of Middle Tennessee.	Sumner	100	100	100	50	90	70	85	90	85	90	85	80	95	90	25
		Trousdale	100	100	100	25	80	40	100	80	100	20	100	70	100	40	90
		Davidson	25	60	70	70	70	90	100	80	100	80	100	85	70	95	90
		Wilson	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Williamson	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Rutherford	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Cannon	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Maury	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Marshall	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Bedford	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
E	Eastern Section of Middle Tennessee.	Giles	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Lincoln	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Moore	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Macon	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Clay	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Pickett	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Overton	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Jackson	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Smith	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Putnam	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
F	Cumberland Platau.	Dekalb	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		White	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Warren	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Coffee	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Grundy	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Franklin	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Scott	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Fentress	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Morgan	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Cumberland	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
F	Cumberland Platau.	Van Buren	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Campbell	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Bledsoe	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Sequatchie	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Marion	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Franklin	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Scott	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Fentress	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Morgan	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70
		Cumberland	100	100	90	50	50	80	90	50	75	50	75	70	75	90	70

OCTOBER CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT.	COUNTY.																				
	Wheat—acreage sown.	Winter Oats—acreage sown.	Rye—acreage sown.	Corn—yield.	Cotton—yield.	Mill—seed threshed.	Stock Peas—seed threshed.	Sweet Potatoes—yield.	Late Irish Potatoes—yield.	Tobacco—yield.	Sorghum—yield.	Broom Corn—yield.	Peanuts—yield.	Young Clover—condition.	Grasses—condition.	Alfalfa—condition.	Pea Hay—saved.	Apples—yield.	Live Stock—condition.	Hogs—marketed.	
G	Claiborne	50	80	95	95	100	20	100	75	95	80	75	100	80	80	...	...	75	85	80	...
	Hancock	...	85	95	95	100	80	85	45	100	80	75	100	45	90	...	...	75	90	95	100
	Anderson	...	80	100	100	...	...	80	90	100	...	...	...	85	90	...	...	90	100	90	...
	Grainger	...	70	50	35	40	25	90	80	...	95	...	...	75	80	...	...	95	100	100	...
	Union	...	70	75	55	20	30	75	75	...	60	...	...	80	80	75	...	55	95	90	20
	Knox	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Rhea	...	95	90	80	90	95	75	40	...	80	...	...	60	70	...	...	95	80	90	...
	Roane	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Loudon	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	McMinn	...	100	50	95	100	75	85	...	...	100	100	...	95	95	...	...	80	100	95	20
Central Section of East Tennessee.	Meigs	...	100	80	85	90	100	90	75	...	90	40	25	80	80	100	...	80	85	90	...
	Bradley	...	80	85	50	80	40	80	50	50	75	40	25	25	25	100	100	100	100	50	...
	Hamilton	...	25	80	50	70	50	80	...	...	75	...	...	75	80	...	...	80	...	75	...
	James	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Johnson	...	100	75	90	45	...	75	60	80	90	60	...	65	70	50	...	50	100	85	...
	Sullivan	...	75	80	100	...	...	...	...	...	...	...	...	80	75	...	...	...	...	85	...
	Carters	...	40	90	90	75	10	90	40	...	...	...	...	80	80	100	100	50	90	...	
	Hawkins	...	100	100	75	...	...	...	...	100	...	...	100	75	75	80	90	100	...	...	...
	Washington	...	100	100	95	85	100	100	65	100	100	...	...	90	90	...	85	65	90	65	...
	Unicoi	...	...	...	...	...	...	...	...	...	...	...	...	90	90	...	...	...	...	...	...
Mountain Section of East Tennessee.	Greene	...	85	85	65	...	50	95	75	95	90	85	...	90	85	...	95	90	100	...	...
	Hamblen	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Jefferson	...	70	100	100	...	...	...	...	...	...	...	...	90	90	100	100	100	100	10	...
	Cocke	...	100	90	95	80	75	95	40	70	100	...	...	90	90	...	80	75	90	95	...
	Sevier	...	100	100	85	...	...	...	30	95	...	...	90	90	80	95	100	40	90	...	...
	Blount	...	100	75	100	80	85	85	75	...	100	90	80	100	100	100	100	100	100	100	...
	Monroe	...	100	60	80	100	100	100	100	...	...	...	...	100	100	100	50	100	100	...	...
	Polk	...	100	20	80	100	90	100	100	40	50	100	50	50	...	100	100
	State average	...	98	86	87	71	82	78	68	84	87	85	83	72	81	85	78	75	89	62	...

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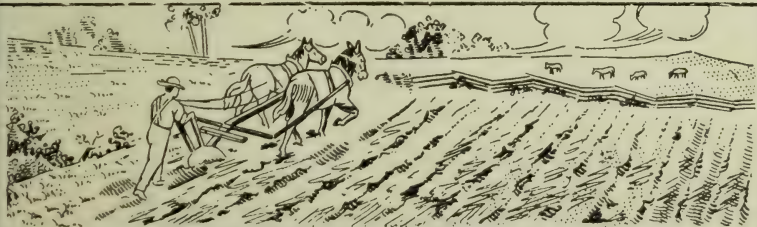
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IN THIS ISSUE

PURE-BRED LIVE STOCK

Different Breeds and List of
Tennessee Breeders



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DECEMBER 1, 1914.

Department of Agriculture.

STATE OF TENNESSEE.

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A. L. GARRISON, Chief Feed, Seed and Fertilizer Inspector.
DR. GEORGE R. WHITE, State Veterinarian.
J. W. SAMPLE, State Chemist.
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DR. J. S. WARD, State Inspector of Apiaries.
HOYT N. HARDEMAN, Stenographer.

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PURE-BRED LIVESTOCK.**The Different Breeds and List of Tennessee Breeders.**

BY HOYT N. HARDEMAN.

This bulletin is intended to give information to the farmers of Tennessee and others interested in regard to the different breeds of livestock raised in this State. It also gives the names and addresses of breeders of pure-bred cattle, hogs and sheep. This list, however, is not complete, nor is it meant, in the lists of names given by counties, to say that they are breeders of registered livestock, except where expressly stated; but rather that those named are owners and in some cases breeders.

CATTLE.

Since cattle come first in importance of the three classes of farm animals above named, this subject will be handled first.

Origin of Domestic Cattle.—The domestic cattle of the world are probably descended from one parent stock, but variation began at a very early period. Through ancient records cattle can be traced back at least four thousand years, and the earliest evidence shows that animals of different types were then known. In various parts of the world there are now cattle so distinct in their characteristics as to justify their claim to be regarded as breeds, and these breeds exceed one hundred in number. A subdivision of a family in the animal kingdom may be recognized as a breed when it has been subjected to and reproduced under the same conditions until it has acquired a distinctive character common to all the members and naturally reproduced with very slight variations. This definition and the term breed applies especially to domestic animals, and the differences which chiefly distinguish the breeds of the present day are the result of artificial treatment by man—the work of skillful breeders having definite objects in view.

The different breeds of cattle to be found in the United States all came from Great Britain and the western portions of Europe, and it is not at all unlikely that they have a common origin in the wild cattle which existed in the ancient forests of Europe.

At the present time each of the various recognized breeds of domestic cattle may be satisfactorily placed in one of two great classes, designated, respectively, as beef cattle and dairy cattle, the latter of which will be taken up first. There are a number of different breeds of dairy cattle raised in the United States. However, all of these breeds are not raised in Tennessee. Only those breeds which are raised somewhat extensively in this State will be taken up.



Jerseys at Ewell Farm, Spring Hill, Tenn.

JERSEY.

The Jersey is unquestionably the most popular breed of dairy cattle in Tennessee, if numbers are taken as the basis of judgment.

Origin of the Jersey.—Lying in the English Channel, some thirty or forty miles from the southern extremity of Great Britain, is an interesting group of islands, the largest of which is the Island of Jersey. It is eleven miles long and considerably less than that in width, and contains 39,680 acres, of which, according to available statistics, about 25,000 acres are tillable. This is the home of one of the most important and widely distributed of the dairy breeds of cattle—the Jersey. The arable land of this island is in the hands of several thousand owners. The holdings vary from three to thirty acres, and herds very seldom exceed a dozen cows. Extensive pastures, therefore, cannot exist, and land and grass are so valuable that cattle are never permitted to roam at large, but are tethered and moved several times a day, always being led instead of driven. Under these conditions a race of highly organized, delicate and gentle cattle has been developed.

The great demand for Jersey cattle came first from England. Because of their beauty they were much sought for to graze in the parks of noblemen. A few Jersey cattle were brought to the United States prior to 1840, but importations did not become active until after the middle of the century. In 1850 several Jerseys were imported by Jno. A. Taintor for a club of gentlemen in Hartford, Conn. In 1851 an importation was made by a Mr. Motley of Massachusetts. In 1868 nine animals were imported to Canada. From that time on until 1890 importations were very numerous, until today the descendants of these animals are seen more frequently than any other breed, wherever dairy cows are kept, from the Great Lakes to the Gulf and from ocean to ocean.

Characteristics.—Jerseys are the smallest in average size of the noted dairy breeds, cows ranging from 700 to 1,000 pounds and the bulls from 1,200 to 1,800 pounds. The highest weight stated is often-times exceeded. However, the average weight of a cow is under 1,000 pounds rather than above it.

The head of the Jersey is small, short, broad, lean and generally dished. The eyes are wide apart, large, bright, and very prominent; the horns small, waxy, with thin shells, and often crumpled. The neck is thin, rather long with clean throat and not heavy at the shoulders. The legs are small, clean and fine, and rather short. The body is well rounded, with capacity for food and breeding; tail long and fine, with a full brush often reaching the ground. The skin is mellow and

loose, with fine, silky hair. In color, this breed varies more than any other. In the United States we find Jerseys ranging in color from all shades of brown to deep black, including the various shades of yellow, fawn and tan color and creamy white, also mouse color or squirrel gray. Bulls are always darker in color than cows. There are always signs or markings about a pure Jersey of a high grade, or something in its appearance hard to describe, by which the blood is unmistakably shown. The udder of the Jersey is full in form and well up behind. Teats are sometimes rather large and wide apart and squarely placed. The milk veins are prominent. This breed has an abundance of coloring matter, which shows itself on the skin on various parts of the body, makes the fat of the body a deep orange, gives a rich tint to milk and cream and a strong golden hue to the butter.



A Herd of Jerseys.

In general appearance the Jersey has a beautiful deer-like form, a large body supported by fine, clean limbs, a small head and crumpled horns, large, lustrous and liquid eyes, and when in milk a decided inclination to spareness in frame.

For scores of years Jerseys have been bred especially for milk and butter. Jerseys are heavy feeders and have a great capacity for assimilating and turning into profit all kinds of cattle forage. As a rule, they will bear rich feeding and forcing for long periods uncommonly well. In the good animals all the extra food is converted into milk. They do not fatten readily. The Jersey cow is essentially a machine for producing milk—butter-making milk—and may be considered worthless when she ceases to give milk. The owner should depend for profit solely upon the produce of the cow while she is alive. Yet Jer-

sey steers and an occasional non-breeding female have been found to take on flesh and make small butcher's beasts, with fine-grained, high-flavored flesh, very rich in color.

Crossing Jerseys upon common cattle, and even upon pure-breds of the other dairy breeds, almost invariably results in adding to the richness of the milk. When butter-making is the chief object on the farm, Jersey blood may oftentimes be used with great advantage.

The Jersey has several weak points, chief among which are small size, lack of width through the heart, and in some instances a tendency to delicacy. Injudicious selection, in-and-in breeding, environment too artificial, and the search for extreme refinement and sparseness are largely responsible for these weaknesses.

Following are the names of breeders of pure-bred Jersey cattle in Tennessee:

BEDFORD COUNTY.

L. D. Green, Shelbyville.
Henry Kerby, Flat Creek.
Robt. Gallagher, Shelbyville.
Dr. J. C. Jackson, Shelbyville.
M. L. Rabey, Shelbyville.
D. G. Stafford, Shelbyville.
R. G. McMillan, Shelbyville.
F. W. Smartt Wartrace.
W. H. Hooser, Wartrace.
J. G. Walker, Wartrace.
O. F. Finney, Wartrace.
W. B. Carroll, Wartrace.
C. N. Kimbro, Shelbyville, R. 5.

BENTON COUNTY.

E. E. McDaniel, Camden.

BRADLEY COUNTY.

Mrs. L. A. Bater, Charleston.
J. U. Varnell, Cleveland.
E. T. Hall, Cleveland.
W. B. Sloan, Cleveland.
J. W. McGhee, Cleveland.
F. L. Shepherd, Cleveland.
T. E. Thatch, Cleveland.
W. M. Bryant, Cleveland.
W. M. McGhee, Cleveland.
T. Blair, Cleveland.
Robt. Richey, Cleveland.
D. W. Duncan, Cleveland.
M. L. Harris, Cleveland.
Eugene Johnson, Cleveland.
Newt Owenby, Cleveland.

CANNON COUNTY.

B. F. Wood, Woodbury.
Walter Hancock, Woodbury.
M. B. McCrory, Woodbury.
W. W. Sullivan, Woodbury.
L. H. McCrory, Woodbury.

CARROLL COUNTY.

D. G. McClure, McKenzie.
S. T. Sparks, McKenzie.

COCKE COUNTY.

W. J. McSween, Newport.
McSween Sisters, Newport.

COFFEE COUNTY.

I. N. Pearson, Tullahoma.
W. H. Daley, Tullahoma.
Mrs. M. Raht, Tullahoma.

CUMBERLAND COUNTY.

Milton Foster, Grassy Cove.
Jas. Smith, Crossville.
C. G. Black, Crossville.

DECATUR COUNTY.

Al Johnson, Decaturville.

FAYETTE COUNTY.

R. L. Day, Somerville.
H. C. Moorman, Somerville.
H. S. Bevan, Somerville.
W. C. Crawford, Williston.

FENTRESS COUNTY.

R. H. Rodgers, Roslin.

FRANKLIN COUNTY.

Frank E. Pittinger, Winchester.

H. A. Wamsley, Winchester.

GILES COUNTY.

F. E. Ranck, Pulaski.

H. K. English, Pulaski, R. 2.

S. C. Appleby, Pulaski.

T. L. Smithson, Pulaski.

Will Ewing, Pulaski.

R. J. Sanders, Pulaski, R. 2.

Jno. Carter, Wales.

GRAINGER COUNTY.

Guy S. Bryan, Tate.

GREENE COUNTY.

D. F. Bolton, Limestone.

F. P. Robinson, Greeneville.

Volley Low, Greeneville.

R. F. Regisler, Greeneville.

HAMBLEN COUNTY.

R. L. Wheeler, Morristown.

HAMILTON COUNTY.

L. D. Roberson, East Chattanooga.

Dr. T. J. Shepherd, Chattanooga.

HANCOCK COUNTY.

T. W. Campbell, Sneedville.

Warner Harrison, Sneedville.

HAWKINS COUNTY.

Frank Duff, Rogersville.

Chas. Beal, Rogersville.

Harvey Johnson, Rogersville.

Martin Davis, Eidson.

C. M. Smith, Rogersville.

HENRY COUNTY.

Mrs. Smallwood, Paris.

HOUSTON COUNTY.

J. C. Hobbs, Erin.

JACKSON COUNTY.

A. H. Johnson, Gainesboro.

D. C. Lynn, Gainesboro.

JAMES COUNTY.

P. M. Cate, Ooltewah.

W. C. Shered, Ooltewah.

Luther Hamby, Ooltewah.

Thos. Burrell, Ooltewah.

JOHNSON COUNTY.

Richard Donnelly, Mountain City.

LAUDERDALE COUNTY.

H. P. Keller, Ripley.

S. S. Carson, Ripley.

Jack White, Ripley.

S. H. Johnson, Henning.

LINCOLN COUNTY.

Hatcher Bros., Fayetteville.

Adrian Warren, Petersburg.

R. K. Morgan, Fayetteville.

MAURY COUNTY.

P. Whitaker & Son, Columbia.

A. N. Akin, Columbia.

Mrs. T. H. Mangrum, Darks Mill

J. N. Meroney, Darks Mill.

J. J. Parish, Darks Mill.

E. J. Davis, Darks Mill.

J. A. Chapman, Darks Mill.

Clover Nook Farm, Spring Hill.

Ewell Farm, Spring Hill.

Cleburne Farm, Spring Hill.

H. M. Polk, Spring Hill.

McMINN COUNTY.

W. Gettys, Athens.

J. C. Baker, Athens.

Will Chestnut, Athens.

Howell Bros., Athens.

T. B. Mayfield & Son, Athens.

H. H. Matlock, Riceville.

McNAIRY COUNTY.

Clem Lea, Selmer.

J. W. Robison, Ramer.

MEIGS COUNTY.

E. T. Hunter, Decatur.

M. S. Hardin, Pin Hook Ldg.

James Lankford, Pin Hook Ldg.

MONROE COUNTY.

Wm. Thomas, Sweetwater.
C. D. Browder, Sweetwater.
C. O. Browder, Sweetwater.
J. C. Waren, Sweetwater.
E. P. Dargen, Sweetwater.
D. C. Young, Sweetwater.
Mrs N. R. Kefauver, Madisonville.

MOORE COUNTY.

Jas. T. Bickley, Lynchburg.
Felix Motlow, Lynchburg.
Carrol Bros., Mulberry.
W. W. Brown, Lynchburg.

MORGAN COUNTY.

Hans Nelson, Stowers.
M. Dorscheid, Stowers.

OVERTON COUNTY.

W. A. Officer, Oak Hill.
Andrew Williams, Rickman.
Isaac Poston, Rickman.

PUTNAM COUNTY.

Hughes & Pointer, Cookeville.
F. H. White, Cookeville, R. 2.
William Stewart, Cookeville, R. 9.
Jerre Whitson, Cookeville.
Carney Rickman, Algood.
Rutledge Smith, Cookeville.
J. B. Dowell, Cookeville, R. 6.
R. L. Kerr, Buffalo Valley.
Sam Denton, Buffalo Valley.

RUTHERFORD COUNTY.

T. H. Crichlow, Murfreesboro.
G. M. Darrow, Murfreesboro.
P. A. Lyon, Murfreesboro.
J. M. King, Murfreesboro.
A. R. King, Murfreesboro.
J. J. Rucker, Overall.
Royal Jersey Farm, Murfreesboro.
T. B. Carney, Murfreesboro.
W. H. Wood, Murfreesboro.
A. C. Johnson, Murfreesboro.
Jim Nesbitt, Murfreesboro.
S. W. Jetton, Murfreesboro.
J. M. Butler, Jr., Murfreesboro.

SHELBY COUNTY.

E. J. Mann, Collierville.
Dr. McKenny, Collierville.

SMITH COUNTY.

J. T. Butts, Gordonsville.
J. P. Baker, Monoville.

STEWART COUNTY.

W. W. Brandon, Dover.
O. T. Reynolds, Dover.
L. N. Taylor, Big Rock.
J. A. Morgan, Big Rock.
Geo. Mathis, Big Rock.

TROUSDALE COUNTY.

J. H. Rickman, Hartsville.

UNICOI COUNTY.

W. J. Peebles, Unicoi, R. 1.

WASHINGTON COUNTY.

C. E. Smith, Afton.

WEAKLEY COUNTY.

Geo. P. Hurt, Martin.
Herbert Lawler, Martin.
George Boyd, Dresden.

WHITE COUNTY.

J. W. Ward, Sparta.
R. L. Snodgrass, Sparta.
J. E. Brandon, Clifty.
W. F. Story, Sparta.
Oscar Carter, Sparta.
R. L. Gillon, Sparta.

WILLIAMSON COUNTY.

J. M. Alexander, Franklin.
Sam N. Warren, Spring Hill.

WILSON COUNTY.

T. S. Dillon, Lebanon.
J. C. Sanders, Lebanon.
J. D. Jennings, Lebanon.
E. Waters, Greenwood.
Will Jones, Watertown.
Joe Barber, Watertown.
W. T. Terry, Lebanon.
Geo. Everson, Lebanon.
Walter Hankins, Greenwood.
T. M. Turner, Watertown.

GUERNSEYS.

Guernsey cattle are so named from the Island of Guernsey, which is the second in size of the Channel Islands off the northwest coast of France. This island is triangular in shape and is about ten miles long in the longest place, and contains about 16,000 acres of land and rock surface. The origin and history of Guernsey and Jersey cattle are practically the same, but in the development of the former more of the characteristics of the parent stock of Normandy have been retained. At present, however, Guernseys can be better compared with Jerseys than with any other cattle. On the island home of the Guernseys they are pastured during the summer by the tethering system as the Jerseys are, and in the winter hay is supplemented with roots and meal and bran. While the Guernsey and Jersey cattle are of the same origin, by a long-continued policy of excluding all other live cattle from the Island of Guernsey, the stock of this island has been built up into a distinct breed.

While there is no reliable information as to when Guernsey cattle began to come to the United States, it is thought that a few head were imported as early as 1850. About 1875 the Guernseys were recognized in the United States as a breed and since that time importations have been made nearly every year. The breed has steadily increased in numbers and as steadily gained in favor wherever introduced.

Characteristics.—Guernseys are a size larger than Jerseys, the average weight of a cow being about 1,000 pounds. They are stronger boned and a little coarser in appearance. They are claimed to be hardier and larger milkers, but both of these points are stoutly disputed. They are generally very handsome and attractive cows. The milk is fully equal to that of the Jersey in butter fat, is even richer in color. The milk is relatively better adapted to making butter than cheese, though for cheese-making it is good also. The naturally rich color of the butter is unexcelled, so that when Guernsey milk is mixed with that from common cows and from certain dairy breeds the color of the butter is proportionately improved.

The Guernseys are only average in maturity, being a little behind the Jerseys probably in this respect. They usually come into milk something over the age of twenty-four months. Their offspring grow to a larger size than the Jersey, and they are, on the whole, more in favor as meat producers, but they should be made ready to kill at an age considerably prior to maturity in order to obtain from them the greatest profit. The cows discarded from the dairy have some capacity for meat-making.

Guernseys are especially valuable for crossing on cows of mixed breeding to produce milkers of fair size and hardihood and that will give a good, fair quantity of high class milk for butter-making.

In appearance, the Guernsey cow generally is as follows: Head rather long, with broad muzzle. The eyes are large, clear and mild. Horns are inclined to be small, circling well forward and considerably upward and yellow and waxy at the base. The ears of the Guernsey are not large nor thick and very thinly covered with hair. The neck is generally long and thin and the breast wide below but not full. The body is large, deep and rangy, the flanks thin, thighs incurved and twist open and roomy. The limbs are moderately fine. The skin is soft and pliable, with plenty of soft short hair. The color of the Guernsey, like the Jersey, varies considerably, including red, light lemon, orange and yellow fawn, sometimes solid but more commonly with white markings. Darker shades, approaching brown, are found upon some cows and are quite common on bulls. The muzzles are almost invariably buff or flesh-colored, surrounded by a fillet of light hair. Occasionally a black nose is found.

The head of a bull is shorter, wider and less dished than that of a cow, and the horns are stronger, shorter and less curved upward. The neck is shorter, thicker and more arched. The forequarters have more relative development and more width through the breast. The skin should be thicker than that of the cow and the carriage and action more pronounced.

The Guernsey has that plain attractiveness and evenness of balance in dairy development which conveys the idea of capacity for everyday work, and her mild look speaks of a quiet and contented disposition. Altogether, the animal is at once recognized as business-like and belonging to the pronounced dairy type of cattle.

In comparing the Guernseys with the Jerseys, they are less clean cut and less handsome than the Jersey and some coarser in the bone and larger in every way. They are plainer in the head, less crumpled in the horn, deeper in the neck, a little wider at the withers, something wider through the heart, a little heavier in the hip, even more prominent at the angular points, a little longer in average length of limb and richer in the color of the skin. As a rule, the formation of udder and average size of teat are even more perfect than in the Jersey. In other respects they are very similar, save in the color markings.

The weak points of the Guernseys are not pronounced in any direction. They are not so rugged as some breeds, but they are not delicate. All in all, the Guernsey is a splendid dairy cow.

Following are the names of breeders of pure-bred Guernsey cattle in Tennessee:

BEDFORD COUNTY.

L. D. Green, Shelbyville.

T. P. Green, Shelbyville.

OVERTON COUNTY.

Frank Gilliland, Rickman.

Joe Lee, Beaver Hill.

PUTNAM COUNTY.

Sam Myers, Cookeville, R. 4.

SHELBY COUNTY.

Jack Clayton, Collierville.

WASHINGTON COUNTY.

J. H. Epps, Jonesboro.

HOLSTEIN.

But little is known with certainty regarding the ultimate origin of this breed. The historians of this race claim that it can be traced back for two thousand years, continuously occupying the territory of North Holland and Friesland and always famous for dairy purposes. Tradition has it that two ancient tribes located upon the shores of the North Sea before the beginning of the Christian era; one possessed a race of cattle pure white and the other a kind all black. Men and cattle became mixed, forming the people and herds which for centuries have occupied that region. These cattle have been known by several different names, in both Europe and America. "Holland cattle," "North Hollanders," "Dutch cattle," "Holsteins," "Dutch-Friesians," "Netherland cattle," and "Holstein-Friesians" are all the same. In Tennessee they are generally called Holsteins.

The first cattle imported from Holland are supposed to have reached the Mohawk Valley about 1621, and other sundry importations are thought to have been made subsequently by Dutch settlers. However, the first importation of which any definite information can be found was made in 1795. Importations did not become general or frequent until about 1870. The Holstein-Friesian Association of America, which was established in 1885, was the pioneer association in establishing a system of advanced registry based on structural form and actual performance.

Holstein cattle are now kept in every State in the Union and deservedly rank very high among dairy cattle. Although they entered the field considerably later, they rank second only to the Jerseys in point of numbers.

Characteristics.—The Holsteins are unquestionably the largest of the distinctive dairy breeds found in America. The cows range in weight from 1,000 to 1,500 pounds, most of them being between 1,100 and 1,400, with an average of about 1,250 pounds. The bulls at maturity are very large and heavy, often above 2,500 pounds in weight.

The large, capacious frame of the Holstein calls for environment where the land is level rather than broken, and rich in forage and grain production.

In the production of milk, quantity alone considered, the Holsteins are without a rival, but the milk does not average so high in butter fat as that of some breeds, although to this there are some exceptions. The milk is excellent for promoting quick development in young animals, since it is rich in constituents that go to form bone, muscle and fibrous tissue.

Because of their large size they do not mature quite so quickly as some of the smaller breeds. The heifers usually become milk producers at from twenty-four to thirty months.

The striking features in the appearance of this breed are the color markings of black and white and the large size of the animals of both sexes. The shining jet black contrasts vividly with the pure white. The average animal carries more black than white, and are never mixed, the lines of each color usually being sharply drawn.

The head of the Holstein cow is decidedly feminine in appearance, comparatively long from eyes to base of horns, broad between the eyes, and slightly dished. The contour of the face is fine, especially under the eyes, showing facial veins. The face is of medium length with broad muzzle. The ears of medium size, thin and quick of movement. The horns are small and fine, often incurving, and frequently with black tips. The neck is long, slender and neatly joined to head and shoulders, the top line slightly curving. The shoulders are fine and even over tops, lower than hips and moderately thick, deep and broad. The chest is also deep and broad. The body is generally well rounded, with large abdomen. The legs of the Holstein are short with feet of medium size. The tail is long and fine, large at setting, tapering finely to a full switch. The udder is capacious, well developed both in front and rear, with teats well formed, wide apart and of good size. The milk veins are usually prominent and sometimes remarkably developed. There is more marked inclination toward the beef form among the bulls than among the cows; the latter are generally of the true dairy type.

In temperament these animals are quiet and docile, bulls as well as cows, and the bulls exceptionally so. They have great constitutional vigor. The calves are large at birth, almost always strong and thrifty, and they grow fast and fatten easily. These animals are very large feeders and to do their best they must have an abundance of rich food without the necessity of much exertion to get it.

Like all other breeds of dairy cattle, the Holsteins have some weak points. The milk of this breed does not average really high in butter fat. The average handling qualities are not so good as in some breeds, which would point to a relatively large consumption of food and the quality of the matured meat does not rank among the very best.

In comparing the Holstein with the Jersey, the Jerseys lead in all-around popularity, in richness of milk, in early maturity and probably in easy keeping qualities. The Holsteins lead in all-around adaptation, in size, in quantity of milk produced, including value of skim milk, in value for meat production and probably in average stamina. In grazing and breeding qualities the difference between the two breeds would not seem to be greatly marked.

In comparing the Holstein with the Guernseys, the Guernseys are considerably less in size and weight and are also more prominent in angular points. They are not so long in the head, are less incurved at the horn, less straight in the back and at the rear, shorter and less square relatively in the hindquarter and thinner and more incurved at the thigh.

In looking at the Holstein, the large parallelogrammic rather than the wedge-shaped frame conveys the idea of much capacity, and the long and slender head, neck and limbs, with the distinctiveness of the black and white markings, convey the idea of generations of careful breeding.

Following are the names of breeders of pure-bred Holstein cattle in Tennessee:

BRADLEY COUNTY.

J. B. Hargis, Cleveland.
J. H. Smith, Cleveland.

CARROLL COUNTY.

Bob Sidna, McKenzie.
S. T. Sparks, McKenzie.

COFFEE COUNTY.

Felix Eversole, Tullahoma.

COCKE COUNTY.

Thos. Odell, Jr., Newport.

CUMBERLAND COUNTY.

Jas. Smith, Crossville.

FRANKLIN COUNTY.

Frank Denson, Winchester, R. 3.
H. Oaks, Winchester.
Jno. Basehart, Winchester.
Frank Schaefer, Winchester.
P. Fathers, Winchester.

GILES COUNTY.

Ranck Brothers, Pulaski.
F. M. Ewing, Pulaski.

GREENE COUNTY.

Dr. Dobson, Greeneville.

HANCOCK COUNTY.

Norman Harrison, Sneedville.

HAWKINS COUNTY.

Sam Kite, Persia.

McNAIRY COUNTY.

Ive Brooks, Selmer.
Jack Robison, Ramer.

MONROE COUNTY.

L. Peck, Madisonville.

OVERTON COUNTY.

Bill Crawford, Windle.
Dave West, Rickman.

PUTNAM COUNTY.

James Bullock, Cookeville.
Fred White, Cookeville.
Will Johnson, Cookeville.

SHELBY COUNTY.

P. E. Oneal, Collierville.

SMITH COUNTY.

W. S. Payne, Riddleton.

STEWART COUNTY.

John Morgan, Dover.
Geo. Le Master, Dover.

AYRSHIRE.

The origin of the Ayrshire breed of cattle is involved in much obscurity, but it is generally supposed that they are made up largely of the blood of the Holderness, Dutch, Alderney, Kerry and West Highland breeds, engrafted upon the native stocks of the country during the eighteenth century. Ayrshires are so named from the county of Ayr, where the breed originated, and which is still its principal center. This county is located in the southwest part of Scotland, stretches for eighty miles along the lower portion of the river Clyde and the Irish Sea. The surface is undulating in large part, with much woodland and a climate moist and rather windy, although not severe. It is a region of moderate fertility, with natural pasturage so distributed that grazing animals must travel long distances in a day to satisfy their hunger. The Ayrshires are the youngest of the well-established types of dairy cattle.

Ayrshires were brought into Canada by Scotch settlers early in the nineteenth century, and during the past two or three decades importations into that country have been frequent. The first importation into the United States is thought to have been made in 1822, to Connecticut. In 1837 there was quite a large herd in Massachusetts, and several importations were made prior to 1845. From that time until 1845 there were more or less importations yearly, but there have since been less. This breed has been a special favorite for dairy purposes in Canada and highly esteemed in New England States and parts of New York. Elsewhere in this country these cattle do not seem to be so well known as their established merits deserve. They are kept, however, in considerable numbers in most of the Eastern States and to some extent in the States of the South, but few are found west of the Mississippi River.

The American Ayrshire Breeders' Association was established in 1875, although breeders had done some organized work since 1859.

Ayrshires are not popular over so wide an area as Holsteins and other breeds, yet in point of numbers they rank third in the United States. They have been introduced into northerly rather than southerly latitudes probably because of their hardihood. They are decidedly

the hardiest of the dairy breeds in Tennessee. This natural vigor combined with their activity fits them for areas where the seasons are somewhat rigorous and where some traveling is necessary in gathering food from the pastures. They are pre-eminently the cow for the dairy farmer where lands are broken and not particularly fertile, and yet they do equally well relatively under better conditions.

Characteristics.—Ayrshires are of medium size among dairy cattle. The average weight of the Ayrshire cow is put at 1,000 pounds, but they sometimes exceed this weight. They are considerably behind the Holsteins in weight, though a trifle ahead of the Guernseys. The bulls attain a weight at maturity of from 1,400 to 1,800 pounds.

The maturing qualities of the Ayrshire are not more than average. The heifers come into milk at the age of from twenty-four to thirty months. In average milk production they rank with the Holsteins. In fact, they will give more milk than either of the other breeds when they have to travel over considerable areas in grazing.

The general form of the Ayrshire cow is wedge-shape. The legs are short in proportion to size. The shoulders are sloping, with chest sufficiently broad and deep to insure constitution. The back is short and straight, the spine well defined, especially at the shoulders, short ribs, the body deep at the flanks. The hindquarters are long and broad, the thighs deep and broad. The cow has a long slender tail set on a level with the back.

The head of the Ayrshire cow is short, with a wide forehead, large muzzle, eyes full and lively, horns wide set on and inclining upward.

The udder of the Ayrshire is capacious but not fleshy. The hind part is broad and firmly attached to the body. Milk veins about the udder and abdomen are well developed.

In color the Ayrshire may be red of any shade, brown or white, or a mixture of these, each color being distinctly defined.

Ayrshires when crossed upon the grades of certain other breeds and upon common cattle of good size produce a fine dairy animal. Excellent results have been obtained by crossing upon Shorthorn and Holstein grades. Ayrshires are excellent breeding animals.

Though quiet and docile generally, the Ayrshires are sometimes over-nervous and shy, and are possessed of that temperament that resents ill-treatment. The teats are frequently a little small for the highest comfort to the milker.

In comparison with the Holstein, the Ayrshire is not nearly so large in size, and are also behind them in general popularity. They are ahead in ruggedness and all-round adaptability, evenness of milk

production and quality of milk and in grazing and breeding qualities. In early maturity, in feeding qualities and in value in crossing and grading, they are probably not far different. The Ayrshire is more active in movement.

In general appearance the Ayrshire is a sprightly looking animal of what may be termed the plain type, with straight top and rear lines and possessed of much relative development in the hindquarters. They are always active and energetic, stop only for a purpose, move off with a brisk walk and often trot without special provocation. Promptness is one of the characteristics of the breed.

Although these cattle can lay no claim to being specially adapted to beef production, the calves are thrifty and full-fleshed, and steers and dry cows fatten readily on suitable feeding. Their carcasses are small, but they always give an unexpectedly large percentage of dressed meat, and its quality is excellent.

BREEDERS OF AYRSHIRE CATTLE.

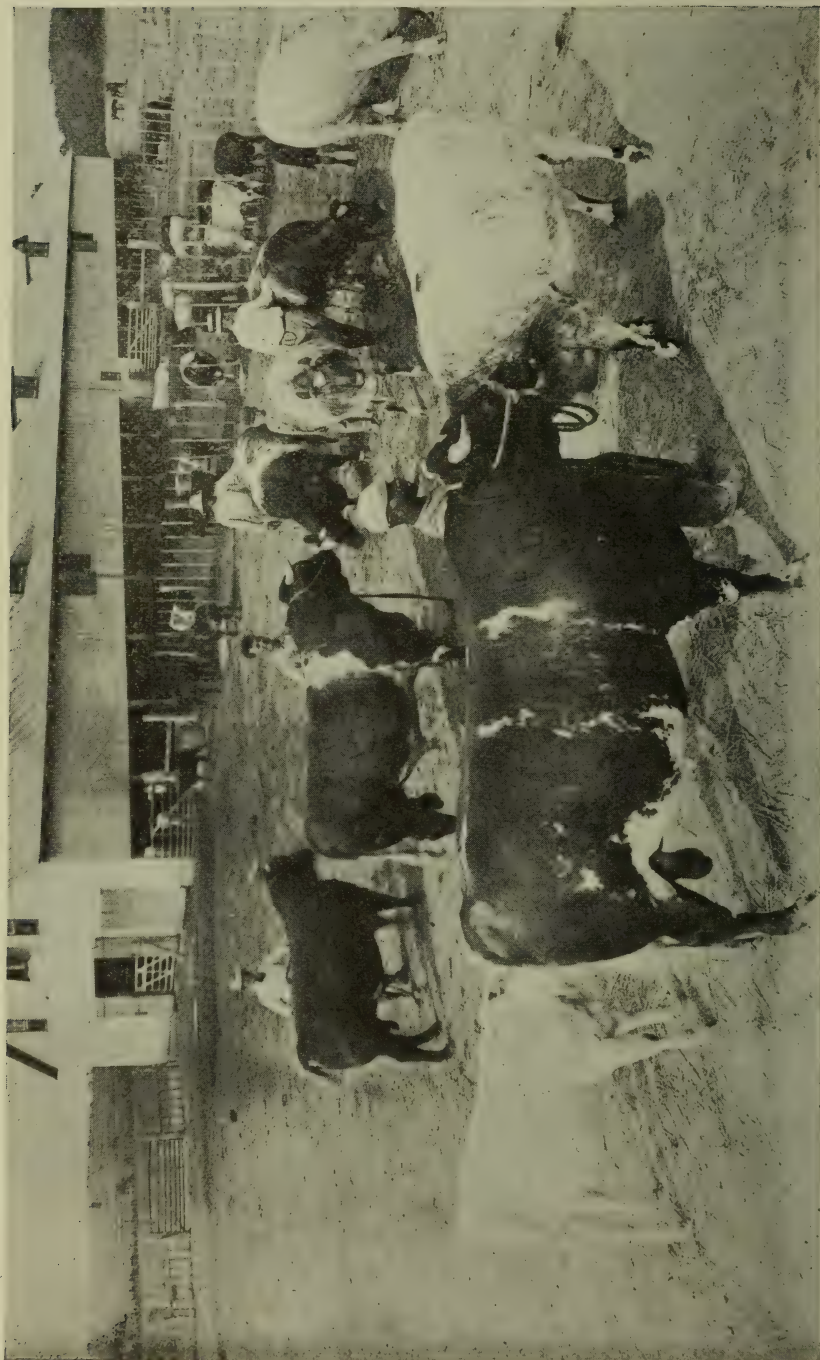
Reports received to date indicate that there are very few if any pure bred Ayrshire cattle in this State. In a number of counties are cattle of this breed mixed with other breeds. Since the names of only the breeders of pure bred cattle were secured, no attempt will be made to give names of farmers owning cross breeds of Ayrshire cattle.

BEEF TYPE OF CATTLE.

The general appearance of the beef animal, when of correct type, shows a distinctly meat-producing form. The animal is compact and broad of back from shoulder points to hips; has a wide, deep body; short and somewhat thick neck; wide, deep, full bosom; rather broad, thick, fleshy hindquarters; and a generally deep, wide body. Viewed from one side the top and bottom lines of body run rather parallel, with the back quite level. From front or rear the outline should be rather full and broad. Cattle of this type are commonly referred to as "blocky," indicating compactness and squareness of form. All the beef breeds have certain features of form which they possess more or less in common. The differences between them relate more to size and to breed peculiarities than to essential features of form.

SHORTHORN.

This breed of cattle is so named from the shortness of the horns which characterizes it. It is sometimes known as the Durham. The origin of the Shorthorn, like that of nearly all the other British breeds



Prize Bulls and Heifers, Lespedeza Farm, Hickory Valley, Tenn.

of cattle, is veiled in obscurity. No doubt the early invaders of England—the Romans, Normans and others—brought over cattle which crossed with the native English stock, and this in part accounts for the variety of these.

The first importation of Shorthorns made to America is thought to have been made by Messrs. Goff and Miller, of Virginia, who brought several of this type of cattle to Baltimore, Md., in 1783, and continued importations until 1795. From that time on importations were made by different parties and the cattle were shipped to the different States until today they are found in all parts of the United States and Canada.

In size the Shorthorn has something of a lead over all breeds in this country. This is owing to their greater scale, combined with good all-round development. With good care and proper food they may be made ready for butchering at the age of about two and one-half years, and under average conditions attain a maximum of growth at about four years.

The grazing qualities of the Shorthorn are only average, since the heavy frame possessed by this breed renders them less active as foragers; hence, when being grazed, the pastures should furnish them with plentiful supplies. The feeding qualities are of the first order. They make good use of the food given them, are contented under confinement, will feed well for a long period, stand forcing well and lay on flesh evenly and deeply. The meat from the Shorthorn is generally tender, juicy and nutritious. The fat, however, is not so well mixed with the lean as in some breeds, the grain of the flesh is not quite so fine nor is the meat so highly flavored. This breed of cattle brings good results when crossed on other breeds. They impart to other breeds, and especially to grades, size, form, quality, rapid growth, early maturity, marked fattening properties, and in many instances good milk production.

In general appearance the Shorthorn has a large, rectangular and yet compact development of body. In color this breed is generally either red, white or roan. Red is most in favor. The legs are short and well placed under the animal. The neck is of medium length, strong and arched in the male, but finer in the female, and gradually widening and deepening as it approaches the shoulder. The head is small in proportion to the size of the animal; forehead, broad between the eyes; face, slightly dished; medium size, straight nose, and large, bright, intelligent eyes.

Of the different types of pure bred beef cattle found in Tennessee the Shorthorn is greatly in the majority.

Following will be found the names of Shorthorn breeders in Tennessee:

BEDFORD COUNTY.

W. W. Hix, Shelbyville.
Wm. C. Hix, Shelbyville.
E. E. Hart, Shelbyville.
John Cunningham, Bell Buckle.
H. A. Clark, Wartrace.
A. W. Yell, Bell Buckle.

BENTON COUNTY.

J. C. Bushong, Camden.
G. B. Bane, Camden.
J. B. Bullock, Camden.

BRADLEY COUNTY.

J. F. Bollman, Cleveland.
R. B. Alexander, Greeneville.
N. C. Myers, Greeneville.

CANNON COUNTY.

A. N. Brown, Woodbury.

CARROLL COUNTY.

S. T. Sparks, McKenzie.
J. R. Smith, McKenzie.

CHEATHAM COUNTY.

John J. Holmes, Pleasant View.

COFFEE COUNTY.

W. B. Walker, Wartrace, R. F. D.

COCKE COUNTY.

Ed C. Burnett, Newport.
J. G. Allen & Son, Newport.

CUMBERLAND COUNTY.

Jas. Smith, Crossville.
J. C. Kemmer, Grassy Cove.
Dandy Smith, Crossville.
C. G. Black, Crossville.
J. S. Garrison, Crossville.

FAYETTE COUNTY.

Tom Moorman, Somerville.
A. H. Harvey, Somerville.

FENTRESS COUNTY.

I. J. Wright, Jamestown.
A. B. Williams, Pall Mall.

FRANKLIN COUNTY.

J. A. Clark, Winchester.
Jno. Kurt, Winchester.
Fred Zimmerman, Winchester.
Austin Ruch, Winchester.

GILES COUNTY.

Clarence Campbell, Campbellsville.
T. M. Stevenson, Pulaski.
F. M. Collins, Campbellsville.
W. R. English, Campbellsville.

GRAINGER COUNTY.

J. F. Rucker, Rutledge.
D. D. Dalton, Idol.
G. M. Henderson, Rutledge.
J. J. Brown, Tate.
J. K. Shields, Tate.

GREENE COUNTY.

Dave Bright, Chuckey.
Jno. Noll, Greeneville.
Jno. Devault, Greeneville.

HAMBLÉN COUNTY.

W. O. Read, Morristown.

HAWKINS COUNTY.

Charles M. Smith, Rogersville.
D. W. Miller, Rogersville.
A. J. Kite, Persia.
H. R. Kite, Persia.

HENRY COUNTY.

A. P. Diggs, Paris.
H. R. Shupe, Paris.
Dr. Rogers, Paris.

HOUSTON COUNTY.

Jno. Holoran, Waverly.
C. D. Askew, Stewart.
W. M. Adkins, Erin.

JACKSON COUNTY.

H. L. Baugh, Flynns Lick.
J. P. Grisham, Granville.
W. L. Hall, Ooltewah.
Joe McAmos, Ringgold, Ga.

JEFFERSON COUNTY.

D. M. Caldwell, New Market.



"Secret Goods," 2-year old Prize-Winning Shorthorn Bull, Lespedeza Farm, Hickory Valley, Tenn.



Banner Bearer, 1st Prize Senior Yearling Shorthorn Bull, Lespedeza Farm, Hickory Valley, Tenn.

JAMES COUNTY.

J. W. Andrews, Martha.
J. L. Chamber, Lebanon.
W. L. Hancock, Lebanon, R. 4.

JOHNSON COUNTY.

H. T. D. Wills, Shouns.
Baxter G. Wills, Mountain City.
B. R. Brown, Shouns.
J. A. Shull, Neva.
J. N. Wills, Mountain City.

LAUDERDALE COUNTY.

Albert Hutcheson, Ripley.

LINCOLN COUNTY.

J. R. Childress, Fayetteville.
W. A. Hampton, Fayetteville.
D. L. Conger, Fayetteville.
Little Brothers, Fayetteville.

McMINN COUNTY.

Ernest Isbell, Athens.

McNAIRY COUNTY.

Jim Mitchell, Bethel Springs.
Dick Miller, Bethel Springs.

MEIGS COUNTY.

T. G. Davis, Decatur.
Scott Stewart, Decatur.
Shiflett Bros., Georgetown.

MONROE COUNTY.

G. W. Kile, Madisonville.
J. R. Love, Sweetwater.
E. L. McCampbell, Sweetwater.

MOORE COUNTY.

Lem Motlow, Lynchburg.
Felix Motlow, Lynchburg.
Geo. Holt, Lynchburg.
A. F. Waggoner, Mulberry.

MORGAN COUNTY.

Robert Lyons, Stowers.

OVERTON COUNTY.

O. T. Carr, Livingston.

Bill Cullom, Livingston.

Geo. Cooper, Rickman.

Alex Smith, Henard.

L. R. Mullins, Nettle Carrier.

PUTNAM COUNTY.

T. J. Bullock, Cookeville.
James Officer, Sparta.
J. T. Pointer, Algood.
Jas. Neighbors, Baxter.

RUTHERFORD COUNTY.

R. H. Smith, Murfreesboro.
Bob Smith, Overall.

SHELBY COUNTY.

E. J. Mann, Collierville.

SMITH COUNTY.

W. S. Parkhurst, Pleasant Shade.
Ellis Kemp, Difficult.
C. S. Key, Monoville.
C. L. Porter, Riddleton.

STEWART COUNTY.

T. J. Gray, Moltke.
Geo. W. Edwards, Moltke.

UNICOI COUNTY.

Bob Anderson, Unicoi.
J. A. Anderson, Unicoi.
C. H. Erwin, Unicoi.

WASHINGTON COUNTY.

C. B. Carson, Limestone.

WEAKLEY COUNTY.

J. B. Abbington, Martin.

WHITE COUNTY.

J. S. Officer, Sparta.
W. J. Breeding, Sparta.
R. L. Broyles, Sparta.

WILLIAMSON COUNTY.

Dr. Pope, Bethesda.

WILSON COUNTY.

T. M. Turner, Watertown.
J. L. Hoover, Granville.

HEREFORD.

But little is known regarding the origin of Hereford cattle. The native home of this breed is the county of Hereford, in England. It is thought that this breed of cattle is descended from one or more of the aboriginal breeds of Great Britain.

The first accredited importation was made into the United States in 1817 by Henry Clay, of Kentucky. Importations have been more or less frequent since that date, and they have been distributed in the United States and Canada until now nearly every State in the Union, and nearly every province of Canada, has its quota of Herefords.

In average size and weight, as a breed, they almost equal the



Shorthorn Cow, Lespedeza Farm, Hickory Valley, Tenn.

Shorthorn, and in some few instances individual animals outweigh Shorthorns. In early maturing qualities they fully equal the Shorthorns. Their grazing properties are decidedly superior, since they take on flesh rapidly on good pastures. The two breeds are about equal in feeding qualities.

The quality of the meat of the Hereford is very good—juicy and tender, the fat and lean nicely blended. Herefords cross well with most other breeds.

In general appearance the Hereford is characterized by a large rectangular and compact body. In color the face, throat, chest, legs,

lower part of the body, crest and tip of tail are a beautiful white, and all other parts are red. As in the other of the typical beef breeds the legs of the Hereford are short and well placed. The head should be small in proportion to the size of the body, with medium length neck, somewhat arched in the male.

In comparison with the Shorthorn the Hereford is somewhat ahead in grazing and breeding qualities and in quality of meat. The Shorthorn has a little advantage in size and in milking properties. The



Junior Herd, Shorthorn Cattle, Lespedzza Farm, Hickory Valley, Tenn.

horns of the Hereford are longer and more spreading, the briskets lower. The coats of the Hereford are much more curly, with the difference in color above mentioned.

Following are the names of Hereford breeders in Tennessee:

BEDFORD COUNTY.

G. L. Carter, Shelbyville.
T. N. Greer, Shelbyville.
J. D. Hutton, Shelbyville.
W. O. Partee, Bell Buckle.

BENTON COUNTY.

O. Lashlee, Camden.

BRADLEY COUNTY.

F. L. Shepherd, Cleveland.
T. E. Thatch, Cleveland.
C. A. Mill, Cleveland.

CANNON COUNTY.

Joe D. Hawkins, Woodbury.
W. C. Houston, Woodbury.
Walter Hancock, Woodbury.
Ed Hollandsworth, Woodbury.
Clark Barton, Woodbury.

CARROLL COUNTY.

Cooper Miller, Paris.

COCKE COUNTY.

A. R. Swann, Oak Grove.

CUMBERLAND COUNTY.

Harry Martin, Howard Springs.
Sam Horn, Crossville.
A. L. Garrison, Crossville.

FAYETTE COUNTY.

F. Kyle, Warren.
Geo. Farrar, Somerville.

FENTRESS COUNTY.

G. E. Hutcheson, Allardt.

FRANKLIN COUNTY.

Jake Gugleman, Winchester.

GILES COUNTY.

Logan Patterson, Elkton.
Aleck Reed, Pulaski.

GREENE COUNTY.

Jno. Brooks, Greeneville.
Thos. Broyles, Greeneville.
J. B. Brooks, Greeneville.
T. D. Leming, Greeneville.

HANCOCK COUNTY.

Jno. Martin, Sneedville.

HAWKINS COUNTY.

Jno. Chunt, Rogersville.
M. B. Davis, Rogersville.
A. Lyons, Rogersville.
T. R. Webster, Persia.

HENRY COUNTY.

Cooper Miller, Paris.

HOUSTON COUNTY.

Rodney Blake, Erin.

JACKSON COUNTY.

Sam Cassetty, Haydensburg.
A. H. Johnson, Gainesboro.

JAMES COUNTY.

Ed Robinson, Ooltewah.
Jno. Gibson, Ooltewah.

JEFFERSON COUNTY.

G. C. McBee, Straw Plains.

JOHNSON COUNTY.

E. E. Butler, Mountain City.
J. N. Wills, Mountain City.

LAUDERDALE COUNTY.

Clyde Johnson, Ripley.
W. R. Farmer, Ripley.
J. T. Ferguson, Curve.

LINCOLN COUNTY.

D. L. Conger, Fayetteville.
E. C. Ashby, Fayetteville.
B. B. Smythe, Petersburg.

MEIGS COUNTY.

W. A. Ewing, Tennessee Mills.
G. S. Baldwin, Erin.

McNAIRY COUNTY.

Jim Mitchell, Bethel Springs.

MONROE COUNTY.

Jno. Latimore, Vonore.
T. A. Yearwood, Sweetwater.

MORGAN COUNTY.

C. Nelson, Stowers.

OVERTON COUNTY.

Bud Eldridge, Brotherton.
W. C. Deck, Livingston.
W. A. Willeford, Algood.

PUTNAM COUNTY.

Sam Myers, Cookeville.
Harvey Terry, Sr., Cookeville.
Vance Hunter, Algood.
James Hunter, Algood.
L. Farley, Cookeville.
R. F. Maxwell, Silver Point.

RUTHERFORD COUNTY.

J. H. Carson, Lascassas.
Tull Donnell, Lascassas.

SHELBY COUNTY.

H. W. Mann, Collierville.

STEWART COUNTY.

A. A. Acree, Model.
A. J. Gray, Moltke.
J. W. Lewis, Cumberland City.

WEAKLEY COUNTY.

W. A. Parrish, Union City.

WHITE COUNTY.

J. W. Terry, Sparta.
H. C. Smith, Sparta.
W. T. Smith, Sparta.

WILLIAMSON COUNTY.

T. C. Boyd, Bethesda.

WILSON COUNTY.

Jno. Cason, Lascassas.

ABERDEEN-ANGUS.

The origin of the Aberdeen-Angus is purely speculative. Among the wild cattle of Britain were polled animals, and the Aberdeen Angus may have descended from these. The native home of this breed is in Northeastern Scotland, especially in the county of Aberdeen.

The first introduction of the Aberdeen-Angus cattle to America was made in 1873, when George Grant, of Victoria, Kans., imported three bulls, two of which were shown at the Kansas State Fair. There are probably now more herds of this breed of cattle in the United



Pure-bred and Grade Aberdeen-Angus Cattle on the Jones Farm at Newbern, Tenn.

States than in Scotland. They are reared in nearly every State in the Union; the more important centers, however, are Iowa, Illinois, Missouri, Ohio and Indiana.

In size they follow closely the Shorthorns and Herefords, although they do not possess quite the same average size.

In grazing their qualities are about average. They feed well and will generally mature for the block at the age of about two years and six months. In quality of meat they are probably ahead of both the Shorthorns and Herefords. The flesh as a rule is well mixed and contains a large proportion of compact, finely grained meat.

Aberdeen-Angus cattle cross particularly well with Shorthorn grades. They are also excellent for crossing upon common stock where quick feeding, absence of horn and a high quality of meat are desired.

In general conformation this breed differs somewhat from the Shorthorn and Hereford, the head being polled, and the body more cylindrical in form, while compactness is a strong feature. The head tapers at the poll and is somewhat prominent in the forehead, while the distance between the prominent eyes is considerable and the length of nose only medium.

The head as a whole impresses one as belonging to a good feeder type, showing a strong, full muzzle and nostril. The neck is usually smoothly attached to head and shoulder, but the shoulder sometimes tends to be a bit prominent instead of nicely laid. The typical body has a rounded turn of rib, thus not showing the broad flat loin so common with Shorthorn or Hereford. The ribs show considerable depth. The back is broad and straight. The hips of the Aberdeen Angus are usually well laid in. The legs are rather short and fine in quality of bone and joint. The almost universal color is black, though red occurs at rare intervals.

The chief differences between the Aberdeen-Angus and the two breeds previously mentioned have been given in this description.

There are very few pure bred Aberdeen-Angus cattle in Tennessee, that is, cattle entitled to registration. This breed is, however, frequently found crossed with other breeds of cattle.

Following are the names of breeders of pure bred Aberdeen-Angus cattle in Tennessee:

BEDFORD COUNTY.

H. T. Parker, Flat Creek.
R. F. D. Bolling, Wright.
Kirk Sysant, Petersburg.

BRADLEY COUNTY.

Jno. W. Bowman, Cleveland.

CARROLL COUNTY.

G. E. Porter, Paris.

COFFEE COUNTY.

A. M. Worden, Tullahoma.
H. T. Parket, Raus.

COCKE COUNTY.

A. R. Swann, Oak Grove.
J. G. Murray, Newport.
J. M. Jones, Newport.

CUMBERLAND COUNTY.

Jas. Adams, Crossville.
E. Payne, Crossville.

FAYETTE COUNTY.

A. H. Harvey, Somerville.

FENTRESS COUNTY.

V. H. Pile, Pall Mall.
R. C. Pile, Pall Mall.
Wright Bros., Pall Mall.

FRANKLIN COUNTY.

J. E. Kaserman, Winchester.
T. A. Embrey, Winchester.
Womack & Co., Belvidere.

GILES COUNTY.

G. T. May, Pulaski.

GREENE COUNTY.

Wm. Stansbery, Afton.
D. S. Ripley, Chuckey.

HAYWOOD COUNTY.

E. P. Snipes, Denmark.

HAWKINS COUNTY.

L. E. Moore, Church Hill.
Mrs. Joe Webster, Persia.

HENRY COUNTY.

C. P. Hudson, Paris.

JACKSON COUNTY.

Roll Dowell, Granville.
A. B. Hestand, Gainesboro, R. 3.

JOHNSON COUNTY.

Wiley Sutherland, Mountain City.

MAURY COUNTY.

James A. Kinnard, Columbia, R. 4.

MEIGS COUNTY.

J. P. Culvanhouse, Euchee.
S. J. Hornsby, Pin Hook.

MONROE COUNTY.

J. W. Stokeley, Madisonville.

OVERTON COUNTY.

Hollis Johnson, Monterey.
Jack Ray, Monterey.
Y. Cullom, Henard.

PUTNAM COUNTY.

J. B. Dowell, Cookeville.
E. H. Maddus, Buffalo Valley.

RUTHERFORD COUNTY.

Dr. Dunn, Murfreesboro.
A. L. Todd, Murfreesboro.

SHELBY COUNTY.

H. J. Graves, Collierville.

WILLIAMSON COUNTY.

J. R. Buckner, Thompson Station.

WILSON COUNTY.

Leeman & Brys, Lebanon.

SWINE.

Of the numerous breeds of swine raised in America only those adapted to Tennessee conditions will be discussed. These consist of the Berkshire, Poland China, Duroc Jersey and the Hampshire.

BERKSHIRE.

The Berkshire hog, so named from the county of Berkshire, England, is one of the oldest of the improved breeds of swine. Berkshires are kept in nearly every State in the Union. They are excellent grazers and possess a good quality of bone. As feeders their strong digestive and assimilative powers enable them to give a maximum return in flesh for the food consumed. They produce excellent pork or bacon, as the fat and lean are fairly well intermixed.

The American Berkshire Association describes the Berkshire as follows:

Color—Black, but skin and hair occasionally showing tinge of bronze or copper color, with white on feet, face, tip of tail and occasional splash on the arm.

Face and Snout—The latter short, broad and meaty, the former fine, well dished and broad between the eyes.

Eye—Very clear, rather large.

Ear—Sometimes almost erect but generally inclined forward.



Berkshire Sow and Pigs.

Jowl—Full and heavy, running back well on neck.

Neck—Short and broad on top.

Hair—Fine and soft.

Skin—Smooth and pliable.

Shoulder—Smooth and even on top and in line with side, thick through chest.

Back—Broad, long and straight or slightly arched, ribs well sprung.

Side—Deep and well let down, straight side and bottom line.

Flank—Well back and low down on leg, making nearly a straight line with lower part of side.

Loin—Full and wide.

Ham—Deep and thick, extending well up on back and holding thickness well down to hock.

Legs and Feet—Short, straight and strong, set wide apart, with hoofs nearly erect and capable of holding good weight.

Size and Symmetry—Size, all that is possible without loss of quality or symmetry, with good length.

Following are the names of breeders of pure bred Berkshire swine in Tennessee:

BEDFORD COUNTY.

Sam Butler, Shelbyville.

W. C. Hix, Shelbyville.

Coble Bros., Shelbyville.

H. A. Clark, Wartrace.

BENTON COUNTY.

P. Madrey, Camden.

N. Nance, Camden, Tenn.

BRADLEY COUNTY.

Jim Jones, Cleveland.

T. E. Thatch, Cleveland.

CANNON COUNTY.

L. B. McFerrin, Woodbury.
W. W. Moore, Woodbury.
B. P. Lester, Woodbury.

CARROLL COUNTY.

R. A. Mooney, Henry.

CHEATHAM COUNTY.

Williams Bros., Pleasant View.

COFFEE COUNTY.

A. M. Worden, Tullahoma.

COCKE COUNTY.

Ed C. Burnett & Son, Newport.
Robt. Bell, Parrottsville.

CUMBERLAND COUNTY.

O. B. Rector, Crossville.
C. E. Snodgrass, Crossville.

FENTRESS COUNTY.

Geo. Brown, Banner Springs.
C. Choate, Banner Springs.
W. J. Gaudin, Jamestown.
W. M. Johnson, Forbus.

FRANKLIN COUNTY.

Lucas & McGill, Huntland.
Will Lipscomb, Winchester.
J. E. Kasserman, Winchester.

GILES COUNTY.

W. B. Romine, Pulaski.
J. H. Kimbrough, Aspen Hill.

GRAINGER COUNTY.

N. J. Johnson, Tate.

GREENE COUNTY.

E. B. Dobson, Greeneville.
E. J. Cook, Afton.
C. E. Smith, Afton.
J. B. Park, Tusculum.

HAWKINS COUNTY.

Geo. Berry, Rogersville.
H. R. Kite, Persia.

HENRY COUNTY.

E. L. Siggs, Paris.
H. R. Shupe, Paris.
Earnest Diggs, Paris.

JACKSON COUNTY.

B. C. Butler, Gainesboro.

JAMES COUNTY.

Andy Newton, Ooltewah.

JOHNSON COUNTY.

J. S. Donnelly, Shouns.
J. A. Shull, Neva.
B. G. Wills, Mountain City.
N. R. Wills, Mountain City.

LAUDERDALE COUNTY.

Ed Johnson, Ripley.

LINCOLN COUNTY.

J. J. Holman, Mulberry.

MAURY COUNTY.

Clover Nook Farm, Spring Hill.
Ewell Farm, Spring Hill.
Geo. B. Woodard, Spring Hill.
H. M. Polk, Spring Hill.

McMINN COUNTY.

T. B. Mayfield, Athens.

McNAIRY COUNTY.

Clem Lea, Selmer.
Wm. Hamilton, Selmer.
J. E. Floyd, Ringer.

MEIGS COUNTY.

O. F. Holloman, Euchee.

MONROE COUNTY.

T. C. Bayless, Madisonville.
C. L. Stradley, Madisonville.

MOORE COUNTY.

Ed H. Davis, Lynchburg.

MORGAN COUNTY.

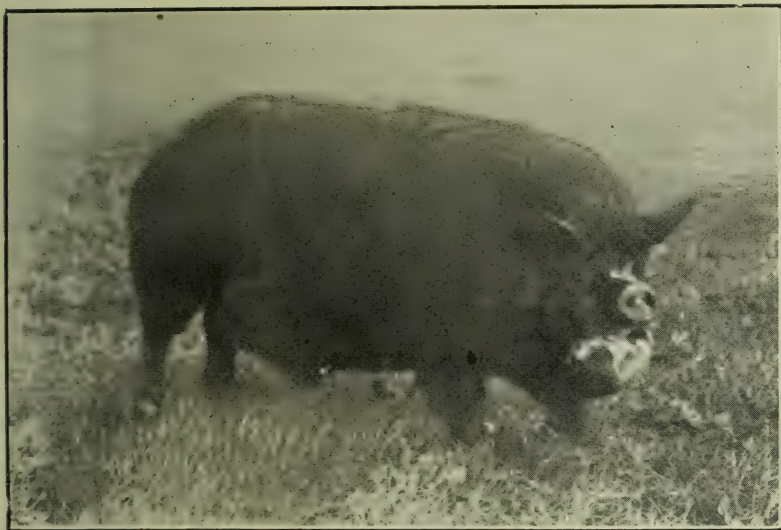
J. J. Nitzschke, Stowers.

OVERTON COUNTY.

Henry Wilson, Beaver Hill.

PUTNAM COUNTY.

J. T. Hutchison, Cookeville.
Dr. Sims, Sparta.
Joe Lee, Monterey.
W. R. Medley, Silver Point.



Berkshire Boar.

RUTHERFORD COUNTY.

Henry King, Murfreesboro.
A. R. King, Murfreesboro.
J. B. Farmer, Murfreesboro.
T. B. Carney, Murfreesboro.

SEVIER COUNTY.

Fox Brothers, Sevierville.

SHELBY COUNTY.

E. J. Mann, Collierville.
Jack Clayton, Collierville.

SMITH COUNTY.

Herod Porter, Riddleton.
J. H. Kemp, Difficult.

STEWART COUNTY.

Geo. Scarbro, Dover.
Harvey Bunton, Dover.

UNICOI COUNTY.

J. W. Lucas, Unicoi.
Grover McNabb, Erwin.

WASHINGTON COUNTY.

C. E. Smith, Afton.

WEAKLEY COUNTY.

J. M. Gardner, Martin.

WHITE COUNTY.

James Officer, Sparta.

WILLIAMSON COUNTY.

Sam N. Warren, Spring Hill.
J. W. Smith, Franklin.

WILSON COUNTY.

Wm. McDaniel, Lebanon.
Jno. Knight, Lebanon.
E. Waters, Lebanon.

POLAND CHINA.

The Poland China breed of swine originated chiefly in the counties of Warren and Butler, in the State of Ohio. They are now found in every State of the Union.

Chief characteristics of the Poland China breed are as follows: The head is of medium length and breadth in good specimens, with a rather full jowl below. The face is classed as straight, the nose

and space from below the eyes to nostrils being free of dishing. The cheeks tend to be rounding and full, and frequently are somewhat seamed. The ears should be fine and break over at the top third into a neat droop; thick, heavily attached ears are objectionable. The neck of the Poland China tends to be short and thick, the shoulders a bit prominent but well covered, the back strongly supported with a gradual yet moderate arch the entire length, the loins and ribs being thickly covered, wide and strikingly arched in well fattened specimens. The sides have but moderate length, with an excellent depth. The rump is of medium length, but is frequently somewhat low, so that the entire upper line of the pig from ear to tail has a more curved outline than some other breeds. The hindquarters are characterized by great thickness of flesh, the hams being thick for the entire length from top to bottom, with a full deep twist between. The legs are shorter with this breed than with some others, but too refined a bone and not the strongest of pasterns are common.

The color is black with white in face or lower jaw, white on feet and tip of tail, and a few small, clear white spots on body not objectionable.

In comparison with the Berkshire the two breeds resemble each other not a little in general outline, but the Berkshire is a little longer in limb and not quite so massive in form.

The Poland Chinas have heads a little finer and less dished, snouts rather finer, ears larger and more drooping and more evenness in the relative size of shoulder and hams.

They are also less regular in their distinguishing color markings.

Following are the names of Tennessee breeders of Poland China hogs:

BEDFORD COUNTY.

Frank Parker, Wartrace.
Sam Brantley, Shelbyville.
Joe Harrison, Flat Creek.

BENTON COUNTY.

J. H. Wiseman, Camden.
J. C. Bushong, Camden.

BRADLEY COUNTY.

G. A. Wallace, Cleveland.
T. E. Thatch, Cleveland.

CANNON COUNTY.

Joe Mason, Woodbury.
G. T. Roach, Woodbury.
B. Milligan, Woodbury.

CARROLL COUNTY.

D. G. McClure, McKenzie.
L. H. Mann, McKenzie.

COCKE COUNTY.

Jno. Mantooth, Newport.

FENTRESS COUNTY.

R. C. Pile, Pall Mall.
Jas. B. Reagan, Little Crab.

FRANKLIN COUNTY.

Jake Gugleman, Winchester.

GILES COUNTY.

M. A. Wilkinson, Pulaski.
J. P. Abernathy, Pulaski.

GRAINGER COUNTY.

T. H. Noe, Noeton.

GREENE COUNTY.

Val Myers, Greeneville.

C. E. Smith, Chuckey.

HAWKINS COUNTY.

Charles M. Smith, Rogersville.

Jno. Wilder, Eidson.

A. P. Davis, Rogersville.

HAYWOOD COUNTY.

H. L. Currie, Brownsville.

HENRY COUNTY.

Walter Archer, Cottage Grove.

HOUSTON COUNTY.

Dr. Cooley, Waverly.

C. D. Askew, Stewart.

JACKSON COUNTY.

Elias Gaw, Gainesboro.

JAMES COUNTY.

James Lovell, Georgetown.

JEFFERSON COUNTY.

D. M. Caldwell, Newmarket.

JOHNSON COUNTY.

J. K. Wilson, Mountain City.

J. W. Johnson, Mountain City.

A. C. Cole, Mountain City.

LAUDERDALE COUNTY.

Walter Heart, Ripley.

H. P. Keller, Ripley.

O. D. Williams, Ripley.

LINCOLN COUNTY.

E. C. Shofner, Mulberry.

Will Rhea, Fayetteville.

MARSHALL COUNTY.

Hoyle Montgomery, Lewisburg.

J. H. Pritchard, Napier.

McMINN COUNTY.

Arthur Prather, Athens.

McNAIRY COUNTY.

J. H. Moss, Selmer.

J. W. Robison, Ramer.

MEIGS COUNTY.

J. L. Chastain, Euchee.

MONROE COUNTY.

H. B. Dyer, Sweetwater.

MOORE COUNTY.

T. A. Hays, Lynchburg.

Spoon Motlow, Lynchburg.

MORGAN COUNTY.

Jno. Bramstudder, Stowers.

PUTNAM COUNTY.

Samuel Myers, Cookeville.

Jas. Officer, Sparta.

Hughes & Pointer, Cookeville.

Jim Terry, Sparta.

J. Bartlett, Silver Point.

RUTHERFORD COUNTY.

Tom Brown, Murfreesboro.

H. T. Parker, Tullahoma.

SHELBY COUNTY.

J. B. Cartwright, Collierville.

SMITH COUNTY.

C. L. Porter, Riddleton.

Rev. D. Stone, Pleasant Shade.

C. S. Key, Monoville.

STEWART COUNTY.

Geo. Scarbro, Dover.

A. J. Rolls, Dover.

WEAKLEY COUNTY.

Tom Parrish, Martin.

WHITE COUNTY.

J. R. Mitchell, Sparta.

J. W. Terry, Sparta.

W. J. Breeding, Sparta.

Frank Simmons, Ravenscroft.

J. S. Officer, Sparta.

WILLIAMSON COUNTY.

W. H. Glass, Franklin.

WILSON COUNTY.

H. Young, Lebanon.

T. S. Dillon, Lebanon.

S. F. Donnell, Shop Springs.

Harry Young, Watertown.

R. H. Young, Lebanon, R. 1.

DUROC-JERSEY.

The American Duroc Jerseys are apparently the outcome of the union of two classes of swine, known respectively as the Durocs and Jersey Reds. The Durocs, of medium size and bone, have been bred for many years in Saratoga County, N. Y. The Jersey Reds, large in size and coarse in bone, hair and flesh, have been bred in New Jersey for the past fifty years. The origin and early development of this breed is not very well known.

The Duroc-Jersey has proven well adapted to sections where good rustling qualities are important. Their grazing qualities are good, as they are an active and hardy breed.

This breed answers well for crossing upon breeds more refined and more delicate of constitution, but to cross them upon large, vigorous and somewhat coarse pigs would probably be a mistake.

In breeding qualities they rank high among the American breeds and the young pigs possess a fair degree of hardihood.

Following is a description of the Duroc-Jersey drawn up by the American Duroc-Jersey Swine Breeders' Association:

Small head in proportion to size of body, wide between eyes; face nicely dished and tapering well down to nose; surface smooth and even.

Eyes—Lively and bright.

Ears—Medium, moderately thin, pointing forward and downward and slightly outward.

Neck—Short, thick and very deep, slightly arching.

Jowl—Broad, full and neat.

Shoulders—Moderately broad, very deep and full.

Chest—Large; very deep, filling full behind shoulders, and breast-bone extending well forward so as to be readily seen.

Back and Loin—Medium in breadth, straight or slightly arching, carrying even width from shoulder to ham.

Sides and Ribs—Sides very deep; medium length; level between shoulders and hams and carrying out full down to line of belly; ribs long, strong, and sprung in proportion to width of shoulders and hams.

Ham—Broad, full and well down to hock.

Legs and Feet—Medium in size and length, strong, nicely tapering, wide apart and well set under body.

Color—Cherry red without other admixtures.

Size—Large for age and condition; boars two years old and over should weigh 600 pounds or over; sows, same age and condition, 500 pounds.

Disposition—Very quiet and gentle; easily handled or driven.

In general appearance the Duroc-Jerseys, with their rather light, straight heads, drooping ears and smooth and neat frames, bear no little resemblance to Poland Chinas in form, but they are somewhat larger and stronger in limb.

Following are names of Duroc-Jersey breeders in Tennessee:

BEDFORD COUNTY.

C. N. Kimbro, Shelbyville.
R. G. McMillon, Shelbyville.
C. J. Jenkins, Shelbyville.
W. H. Hoover, Shelbyville.
Jno. Morgan, Shelbyville.

BENTON COUNTY.

G. B. Bane, Camden.
J. H. Wiseman, Camden.

BRADLEY COUNTY.

U. P. Powell, Cleveland.
Hiram T. Hall, Cleveland.

CANNON COUNTY.

W. H. Keele, Woodbury.

CARROLL COUNTY.

Bob Sidna, McKenzie.
Will Todd, McKenzie.
C. McNeil, McKenzie.

CHEATHAM COUNTY.

V. A. Bradley, Pleasant View.

COCKE COUNTY.

J. F. Stanberry, Edwina.

CUMBERLAND COUNTY.

James Smith, Crossville.

FENTRESS COUNTY.

S. H. Beaty, Banner Springs.

FRANKLIN COUNTY.

J. A. Clark, Winchester.
Elk Valley Duroc Co., Winchester.

GILES COUNTY.

Ranck Bros., Pulaski.
R. J. Sanders, Pulaski.
H. K. English.

GREENE COUNTY.

Wm. Stansbery, Afton.

HAWKINS COUNTY.

T. J. Davis, Eidson.
Frank Smith, Surgoinville.
M. B. Davis, Eidson.
W. W. Martin, Persia.

HAYWOOD COUNTY.

C. W. Beard, Brownsville.

HENRY COUNTY.

A. P. Diggs, Paris.
Hagin Winn, Paris.

HOUSTON COUNTY.

Sid Boone, Cumberland City.

JACKSON COUNTY.

D. C. Morgan, Gainesboro.
Dr. S. B. Fowler, Gainesboro.
P. R. Hoover, Gainesboro.

JAMES COUNTY.

Ed Robinson, Ooltewah.

JOHNSON COUNTY.

H. T. D. Wills, Shouns.
N. T. Wills, Mountain City.
M. E. Wilson, Mountain City.
W. H. Davis, Mountain City.

LAUDERDALE COUNTY.

W. R. Farmer, Ripley.
H. P. Keller, Ripley.

LINCOLN COUNTY.

Drew Wade, Fayetteville.
L. M. Whitaker, Fayetteville.
M. D. Creson, Mulberry.

MARSHALL COUNTY.

Jno. White, Chapel Hill.

McMINN COUNTY.

Edd Long, Athens.

MEIGS COUNTY.

G. C. Ewing, Erie.
E. S. Boggess, Erie.

MONROE COUNTY.

R. L. Mimms, Sweetwater.

MOORE COUNTY.

Joe F. Baxter, Mulberry.

Jim Wagoner, Mulberry.

OVERTON COUNTY.

Irvin Alred, Alred.

Charlie Verble, Rickman.

W. Y. Keisling, Nettle Carrier.

PUTNAM COUNTY.

T. J. Gregory, Cookeville.

R. H. Dowell, Granville.

R. F. Maxwell, Silver Point.

RUTHERFORD COUNTY.

W. T. White, Murfreesboro.

SHELBY COUNTY.

R. L. Cox, Collierville.

H. W. Mann, Collierville.

SMITH COUNTY.

C. L. Porter, Riddleton.

STEWART COUNTY.

J. W. Rice, Dover.

J. A. Morgan, Dover.

O. T. Reynolds, Dover.

WEAKLEY COUNTY.

M. W. Robinson, Martin.

J. C. Connell, Martin.

WILLIAMSON COUNTY.

W. C. Wright, Franklin.

WILSON COUNTY.

E. Waters, Greenwood.

Will Jones, Watertown.

T. S. Dillon, Lebanon.

W. T. Terry, Lebanon.

HAMPSHIRE.

This breed has been known for many years in the United States under the name of Thin Rind. In 1904, by official action of the American Thin Rind Association, this name was changed to the Hampshire.

The origin of this pig is quite obscure. It is stated, however, that the breed was originated in Hampshire, England, early in the last century. About 1820 a retired sea captain named McKay, living near Boston, Mass., is said to have brought some of these pigs from England to Massachusetts, where they became popular under his name and later became known as Thin Rinds on account of the mellow thin skin and soft silky hair.

The characteristics of this breed are as follows: The head is of the straight-faced type, of medium size, with light jowl. The ears, though erect, incline slightly forward. The back tends to be of only medium width, not thick, and is fairly well supported. The shoulders are light and well set in, and have fair width. The body as a whole has only moderate depth and length, producing a fair side of bacon. The legs tend to be somewhat long, but the bone is of good quality, while the pasterns and toes are usually well placed. The color is usually black, with a white belt about the body, this being known as a "listed" color. The white band or list is from four to twelve inches wide, encircling the body just back of and about the forelegs, the latter also being usually white.

The size of the Hampshire does not place it among the largest

breeds, it being about medium size. The sows usually farrow litters of ten or twelve pigs after the first farrowing, and make excellent mothers and nurses. In this respect they rank with the most prolific breeds of American ancestry.

The distribution of this breed is not extensive. The use of the pure-bred boar on common sows will result in a more prolific stock, leaning toward the bacon type.

While there are but few breeders of pure-bred Hampshire hogs in Tennessee, we find numerous crosses with this breed.

The following are breeders of pure-bred Hampshire swine:

BEDFORD COUNTY.		FRANKLIN COUNTY.	
C. A. Kimbro, Shelbyville.		Jno. Warmbrod, Winchester.	
BENTON COUNTY.		HAWKINS COUNTY.	
D. B. Gossett, Camden.		H. W. Hard, Persia.	
CANNON COUNTY.		HOUSTON COUNTY.	
Walter Hancock, Woodbury.		W. M. Adkins, Erin.	
Frank Hoover, Woodbury.		Sid Boone, Erin.	
W. W. Gray, Woodbury.		PUTNAM COUNTY.	
J. C. Mears, Woodbury.		J. B. Ferguson, Buffalo Valley.	
COFFEE COUNTY.		V. L. Hunter, Algood.	
W. E. Lumley, Tullahoma.		WILLIAMSON COUNTY.	
CUMBERLAND COUNTY.		Ed Green, Franklin.*	
A. L. Garrison, Crossville.*			
FENTRESS COUNTY.			
V. H. Pile, Pall Mall.			

*Registered Stock.

SHEEP.

SOUTHDOWN.

The following standard points of the Southdown are set forth by the American Southdown Breeders' Association:

Head—Medium size and hornless, carried well up. The forehead well covered with wool, especially between the ears and on the cheeks.

Ears—Rather small, tolerably wide apart, covered with fine hair, and carried with a lively back and forth movement.

Eyes—Full and bright.

Face—A uniform tint of brown or gray or mouse color.

Neck—Short, fine at head, but nicely tapering, and broad and straight on top at the shoulders.

Shoulders—Broad and full.

Breast—Wide, deep and projecting well forward, the forelegs standing wide apart.

Back and Loins—Broad and straight from shoulders to rump.

Ribs—Well arched.

Rump—Broad, square and full.

Hips—Wide, with little space between them and last ribs.

Thighs—Full and well let down in the twist, the legs standing well apart.

Limbs—Short and fine in bone and in color to agree with face.

Belly—Straight and well covered with wool, the flank extending so as to form a line parallel with the back line.



Sheep on Farm in Dyer County.

Fleece—Compact, the whole body well covered with moderately long and close wool, white in color and carrying some yolk.

Form—Throughout smooth and symmetrical.

General Appearance—Spirited and attractive, with a determined look and proud, firm step, indicating constitutional vigor and thorough breeding.

The following are Southdown breeders in Tennessee:

BEDFORD COUNTY.

G. F. Shofner, Shelbyville.
T. P. Green, Shelbyville.
Ernest Hummel, Bell Buckle.
W. O. Partee, Bell Buckle.

BRADLEY COUNTY.

H. W. Tripp, Cleveland.

CANNON COUNTY.

A. N. Brown, Woodbury.
J. D. Hawkins, Woodbury.
Walter Hancock, Woodbury.
Geo. Kittrell, Woodbury.

COCKE COUNTY.

H. H. Alexander, Newport.

CUMBERLAND COUNTY.

R. R. Dunbar, Crossville.

FENTRESS COUNTY.

Joe Williams, Pall Mall.

FRANKLIN COUNTY.

W. I. Lipscomb, Winchester.

GILES COUNTY.

T. B. Wade, Jr., Pulaski.

H. K. English, Pulaski, R. 2.

JACKSON COUNTY.

J. L. McCarver, Gainesboro, R. 4.

Andy Johnson, Gainesboro.

Geo. Whitaker, Gainesboro.

JOHNSON COUNTY.

H. T. D. Wills, Mountain City.

J. A. Shull, Neva.

Walter Loyd, Mountain City.

LINCOLN COUNTY.

D. L. Conger, Fayetteville.

J. R. Childress, Fayetteville.

J. A. Stewart, Fayetteville.

Conger & Brooks, Fayetteville.

MAURY COUNTY.

J. J. Parish, Darks Mill.

E. C. Gardner, Darks Mill.

MOORE COUNTY.

Lem Motlow, Lynchburg.

MORGAN COUNTY.

C. Nelson, Stowers.

PUTNAM COUNTY.

Hilar Williams, Algood.

Sim Pippin, Cookeville, R. 4.

GRAINGER COUNTY.

J. K. Shields, Tate.

HAWKINS COUNTY.

D. W. Miller, Rogersville.

T. R. Webster, Persia.

SMITH COUNTY.

C. L. Porter, Riddleton.

WILSON COUNTY.

T. S. Dillon, Lebanon.

T. A. McKee, Lascassas.

Walter Hancock, Lebanon.

U. W. Neal, Watertown.

W. S. Baird, Lebanon.

SHROPSHIRE.

The following are standard points of the Shropshire breed of sheep adopted by the American Shropshire Association:

Constitution—Constitution and quality indicated by the form of body; deep and large in breast and through the heart; back wide, straight and well covered with lean meat or muscle; wide and full in the thigh, deep in flank; skin thick but soft and of a pink color; prominent, brilliant eyes and healthy countenance.

Head—Short and broad; wide between ears and eyes. Short from top of head to tip of nose; ears short, of medium size; head should be well covered with wool to a point even with eyes, without any appearance of horns; color of face dark brown.

Neck—Medium length, good bone and muscular development.

Legs and Feet—Broad, short, straight; well set apart; well shaped; color dark brown and well woolled to the knees.

Fleece—Body, head, belly and legs to knees well covered with fleece of even length and quality.

In comparison with Southdowns they are larger and longer in body and carry a heavier fleece. The head has a more complete covering of wool and the wool everywhere is longer, but not so fine. The color of the face and legs is considerably darker.

The following are breeders of Shropshire sheep in Tennessee:

BEDFORD COUNTY.

C. J. Jenkins, Shelbyville.
D. D. Hix, Flat Creek.

BRADLEY COUNTY.

S. M. Thatch, Cleveland.

CANNON COUNTY.

I. N. Hoover, Woodbury.
Walter Hancock, Woodbury.

COCKE COUNTY.

J. H. Murray, Newport.

CUMBERLAND COUNTY.

R. R. Dunbar, Crossville.

FAYETTE COUNTY.

A. H. Harvey, Somerville.

FENTRESS COUNTY.

I. H. Hall, Banner Springs.

GILES COUNTY.

T. B. Wade, Wales.

GRAINGER COUNTY.

J. J. Brown, Tate.
G. McHenderson, Rutledge.

GREENE COUNTY.

E. M. Sentell, Greeneville.

HAWKINS COUNTY.

J. T. Davis, Eidson.
D. L. Hayner, Persia.

HENRY COUNTY.

R. P. Diggs, Paris.

JOHNSON COUNTY.

B. R. Brown, Shouns.
Albert Cole, Mountain City.
Baxter Shoun, Mountain City.
N. R. Wills, Mountain City.
B. G. Wills, Mountain City.
O. C. Wills, Mountain City.
H. T. D. Wills, Mountain City.

LAUDERDALE COUNTY.

J. M. Scott, Ripley.

LINCOLN COUNTY.

Mack Creson, Mulberry.

McMINN COUNTY.

S. Tooney, Mecca.

McNAIRY COUNTY.

J. B. Tulwood, Stantonville.

MONROE COUNTY

L. Peck, Madisonville.

MOORE COUNTY.

Geo. Holt, Lynchburg.

PUTNAM COUNTY.

J. W. Warren, Algood.
Noah Beane, Derossett.
E. H. Maddus, Buffalo Valley.
Scion Maddus, Buffalo Valley.

SMITH COUNTY.

J. H. Brim, Riddleton.

WEAKLEY COUNTY.

Vester Damron, Martin, R. F. D.

DORSET.

In the absence of an authorized scale of points the following are submitted:

Size—Medium for the breed, but of course is affected by environment.

Head—Large rather than small, tapering toward the muzzle and longer than in some breeds, and covered with a tuft of wool of medium length. Horns in both sexes.

Ears—Fairly long, inclining a little outward.

Neck—Not less than medium in length.

Back—Fairly wide, straight and level.

Loin—Broad and long.

Thighs—Full, inclining to long and tapering.

Legs—Medium in length, size and strength.

Fleece—Evenly distributed over the body, coming but a short distance forward on the cheek and down to the knee and hock. The wool inclines to fine.

General Appearance—The Dorset is somewhat long-bodied and of fair symmetry and style, and is active, easy and graceful in its movements.

In comparison with the Southdown, the Dorset is some larger and more rangy in form and limb. It is longer in neck, head and body, not so plump in breast, shoulder and crops, nor quite so round in the spring of rib. The head and legs are white, while those of the Southdown are some shade of brown.

The grazing qualities of the Dorset are excellent. They will eat coarser herbage than some of the other breeds. They stand confinement well and are good feeders.

Following are breeders of Dorset sheep in Tennessee:

BEDFORD COUNTY.

J. G. Walker, Wartrace.

McMINN COUNTY.

Theodore Miller, Athens.

FENTRESS COUNTY.

C. M. Hall, Roslin.

MOORE COUNTY.

Lem Motlow, Lynchburg.

HAWKINS COUNTY.

L. M. Arnott, Persia.

PUTNAM COUNTY.

L. C. Terry, Cookeville.

LAUDERDALE COUNTY.

R. W. Farmer, Ripley.

Hay is a very important crop where there are animals to feed. No farmer can afford to buy hay for his animals with cotton his children produce. A liberal acreage in hay should be planted so that the animals will be properly cared for.

When the sow begins to carry straw it's time to put her in comfortable quarters and to watch for the litter to come.

NUMBER AND VALUE OF DOMESTIC ANIMALS IN TENNESSEE.

The following table shows the number and value, by counties, of domestic animals in Tennessee. The figures are taken from the Federal Census of 1910 as of the year 1909. It is probable that the present number, if ascertainable, would show an increase of at least ten per cent over these figures.

The total number of farms in the State reporting domestic animals for that year was 234,060.

COUNTY	Cattle	Horses	Mules	Asses and Burrows	Swine	Sheep	Goats	Total Value
Anderson	7,926	1,699	1,381	43	6,528	1,452	66	\$ 534,590
Bedford	18,687	8,467	5,814	439	32,624	56,998	1,402	2,628,452
Benton	5,529	1,688	2,784	33	11,723	2,094	72	732,125
Bledsoe	9,180	1,076	798	31	9,850	5,519	464	454,225
Blount	13,252	3,634	2,208	50	14,252	5,543	171	1,054,841
Bradley	9,301	2,059	1,906	56	5,229	1,741	223	657,341
Campbell	7,966	1,522	1,283	25	7,628	2,438	63	509,521
Cannon	8,125	3,522	2,695	112	17,224	15,723	148	985,249
Carroll	10,892	5,680	4,737	108	20,517	3,653	662	1,558,035
Carter	8,477	1,914	731	18	6,223	2,179	20	519,389
Cheatham	3,992	1,547	1,851	20	9,306	1,473	102	553,280
Chester	4,362	2,207	1,643	32	7,277	1,623	626	560,968
Claiborne	12,731	3,271	1,748	40	9,376	4,634	133	967,344
Clay	4,243	1,360	1,563	41	11,621	3,852	56	50,575
Cocke	12,200	2,563	1,847	29	13,652	3,655	117	854,854
Coffee	8,958	3,489	2,526	112	13,534	9,762	598	110,115
Crockett	9,337	5,707	3,125	62	13,594	1,067	584	1,303,113
Cumberland	6,810	856	734	67	9,839	10,006	38	371,154
Davidson	22,911	3,326	4,197	246	20,575	22,160	1,585	2,548,610
Decatur	4,162	1,355	2,177	39	10,285	2,099	268	537,585
DeKalb	8,988	3,957	3,578	124	25,791	8,752	163	1,242,510
Dickson	9,185	2,559	2,811	109	16,321	5,976	524	928,224
Dyer	16,820	5,903	5,469	40	21,009	5,213	489	1,961,323
Fayette	20,200	6,447	5,584	46	21,232	2,683	645	1,840,201
Fentress	4,593	701	878	23	7,106	4,587	30	282,352
Franklin	11,823	4,218	2,882	71	17,052	6,994	849	1,239,041
Gibson	17,836	11,008	7,209	138	23,234	5,759	840	2,749,403
Giles	21,436	8,776	6,333	167	29,256	23,388	2,881	2,575,123
Grainger	9,053	2,866	1,585	48	9,187	4,557	97	811,204
Greene	22,165	9,241	3,235	114	17,708	6,838	207	2,055,481
Grundy	2,924	617	630	22	4,484	1,136	311	230,274
Hamblen	7,258	2,557	1,152	60	7,113	2,272	101	649,535
Hamilton	7,898	1,888	1,266	24	5,301	1,392	223	544,390
Hancock	6,700	1,879	1,013	36	7,171	3,093	88	525,031
Hardeman	14,028	4,563	3,518	82	16,769	2,662	841	1,189,721
Hardin	9,549	3,068	4,436	89	20,069	2,498	542	1,150,345
Hawkins	18,685	5,515	2,140	78	14,050	10,554	241	1,365,663
Haywood	14,412	6,628	4,527	39	17,116	2,131	741	1,716,214
Henderson	7,467	2,962	3,948	80	18,592	3,174	834	1,010,179
Henry	11,995	5,900	4,872	92	20,805	5,188	368	1,634,327

NUMBER AND VALUE OF DOMESTIC ANIMALS IN TENNESSEE—Continued.

COUNTY	Cattle	Horses	Mules	Asses and Burrows	Swine	Sheep	Goats	Total Value
Hickman	8,117	2,129	3,239	42	17,051	6,538	167	960,807
Houston	3,044	666	1,040	11	4,614	2,465	231	277,078
Humphreys	8,623	1,616	2,937	32	15,917	4,835	484	813,113
Jackson	7,462	2,713	3,200	72	16,694	9,833	33	965,218
James	3,295	709	882	9	3,587	570	168	255,547
Jefferson	11,893	3,467	2,123	57	13,833	3,068	152	1,007,726
Johnson	8,634	1,875	480	21	4,555	5,875	6	490,869
Knox	18,721	5,700	3,182	119	10,389	1,404	155	1,561,386
Lake	4,273	859	2,197	4	7,744	.....	71	550,220
Lauderdale	11,910	4,839	3,929	28	16,428	1,058	239	1,396,642
Lawrence	7,021	2,155	2,109	41	11,816	5,050	514	647,219
Lewis	2,239	476	739	13	3,720	2,362	135	218,081
Lincoln	18,056	6,741	6,615	82	37,265	42,430	3,471	2,349,744
Loudon	7,909	2,141	1,416	60	7,248	2,177	185	648,889
Macon	5,706	2,610	2,852	67	9,830	6,424	268	839,738
McMinn	11,244	2,839	2,752	51	8,442	3,867	115	979,020
McNairy	8,064	3,633	2,875	46	15,210	3,552	359	936,302
Madison	13,468	5,874	4,184	31	16,234	2,509	1,137	1,510,675
Marion	7,395	1,178	1,251	25	8,926	3,282	437	476,962
Marshall	15,066	7,230	5,039	440	26,737	34,317	1,938	2,250,068
Maury	22,841	9,394	8,126	251	37,231	48,346	928	3,301,497
Meigs	5,826	1,372	1,273	22	4,530	1,724	48	433,258
Monroe	13,252	2,944	2,404	104	11,180	4,761	123	971,330
Montgomery	10,739	3,884	5,672	56	20,151	4,615	442	1,522,576
Moore	4,418	1,648	1,468	25	8,473	6,625	534	560,369
Morgan	6,174	821	703	10	6,747	6,472	265	321,328
Obion	15,027	8,049	5,898	68	48,346	14,668	759	2,525,350
Overton	6,625	1,910	2,622	52	13,695	5,639	54	696,673
Perry	4,880	792	2,086	22	14,201	2,466	139	551,331
Pickett	2,362	709	838	18	4,506	2,444	4	246,932
Polk	4,964	713	1,059	24	4,718	2,527	59	320,551
Putnam	7,800	2,838	3,000	80	14,845	6,371	284	943,474
Rhea	6,967	1,515	1,217	27	3,768	1,304	194	455,472
Roane	9,468	2,093	1,772	28	6,419	1,539	96	667,650
Robertson	8,158	4,486	4,525	66	15,251	4,776	357	1,543,784
Rutherford	24,184	9,927	6,812	452	31,981	28,397	1,895	2,843,452
Scott	5,850	980	644	18	8,194	6,258	137	315,926
Sequatchie	3,797	441	419	11	3,746	1,810	50	200,707
Sevier	15,054	3,437	2,081	41	16,300	5,128	174	1,024,765
Shelby	26,381	8,243	7,454	62	27,411	3,125	1,236	2,769,986
Smith	11,939	5,740	4,847	132	24,143	29,489	142	1,787,759
Stewart	7,384	1,849	3,402	45	14,064	3,652	466	830,325
Sullivan	16,263	4,996	1,610	36	10,472	6,999	14	1,165,786
Sumner	17,560	3,006	4,659	168	24,179	40,084	466	2,227,142
Tipton	13,619	6,312	5,031	63	21,902	2,002	1,004	1,925,196
Trousdale	4,236	2,011	1,552	42	6,488	12,869	133	618,760
Union	3,017	358	376	5	2,210	732	...	147,137
Union	7,601	2,313	1,101	31	5,814	2,371	28	564,924
Van Buren	2,450	367	541	21	4,329	2,738	...	173,274
Warren	7,748	3,775	2,868	88	13,076	4,930	286	1,021,832
Washington	12,993	5,247	1,497	29	10,670	2,199	6	1,073,915
Wayne	6,555	1,519	2,295	55	10,783	7,411	455	624,317
Weakley	13,537	9,556	6,173	88	33,177	6,639	1,321	2,336,234
White	8,426	2,658	2,182	34	11,110	3,332	29	788,090
Williamson	17,550	6,978	5,847	246	30,192	45,951	1,293	2,387,146
Wilson	24,718	9,833	6,149	1,138	37,073	56,806	1,461	2,948,100
Total	996,521	349,709	275,855	7,989	1,387,938	795,033	43,560	\$106,608,122

ANIMAL DISEASE COSTS MILLIONS ANNUALLY.

The Federal Government has already paid out more than half a million dollars in the various States to the owners of cattle that have been killed in order to prevent the spread of foot and mouth disease. The States have contributed another half million, bringing the total sum paid out up to the million dollar mark. This, of course, only refers to the amount paid to farmers, but it does not represent their loss. Where pure-bred herds were involved the remuneration received by the owners was but nominal, while in no case could it be said that the owner received full value for the animals slaughtered. In many cases breeding herds were swept away, though the animals were valued only at what they were worth for meat. It can be easily understood that in the case of good dairy cows the amount paid to the owner would fall far short of covering his loss.

Then there is a quarter of a million dollars additional that has been paid out for salaries of men engaged in fighting the disease, for disinfectants, for labor and for transportation, and, of course, the end is not yet in sight, because many counties in several States are still operating under strict quarantine rules.

The expenditure for stamping out foot and mouth disease, which has already cost between one and two million dollars, is, after all, an infinitesimal matter compared with the total annual loss from animal disease in this country. The Federal Government estimates this at \$212,000,000.

Texas fever and cattle ticks, against which the government is conducting a vigorous campaign, cause a loss of \$40,000,000 a year. Tuberculosis of cattle and other stock comes next, with a loss of \$25,000,000; contagious abortion, \$20,000,000; anthrax, \$1,500,000; scabies of sheep and cattle, \$4,600,000; blackleg, \$6,000,000; glanders, \$5,000,000; other diseases of live stock, \$22,000,000; parasites, \$7,000,000; and poultry diseases more than \$8,750,000, making a total of exactly \$212,850,000 lost by live stock and poultry raisers each year due to various diseases, a large number of which are known to be preventable.—*Iowa Homestead*.

CROP REPORT FOR NOVEMBER.

**T. F. Peck, Commissioner, Department of Agriculture,
Nashville, Tenn., December 1, 1914.**

Correspondents in thirty-six counties of the State failed to report on

crop conditions for the crop month ending Nov. 20, and as a consequence, the report this month is rather incomplete.

The estimates on corn production indicate an increase over the production of last year, notwithstanding indications during the early part of the crop season were very unfavorable. The reports of the department indicate an average of 26 bushels to the acre.

Reports also show a larger acreage sown in winter wheat, winter oats and rye than last year. There was good weather during the autumn months for plowing and sowing, and farmers improved their opportunities.

Reports on cotton production are vague and too much credit may not be given the figures. However, the production was good, probably better than that last year. The reports also show an increase in the yield of tobacco.

The late Irish potato crop was much better than the first crop, and also better than the late crop last season. The drouth during the early summer destroyed the first crop.

Young clover and alfalfa show in better condition than at the same time last season.

Live stock is in good condition. So far the foot and mouth disease has made no appearance in the State, and the Department of Agriculture, through Dr. George R. White, State Veterinarian, is taking such steps as will prevent its introduction into the State. Hog cholera is still prevalent, but the use of anti-hog cholera serum is decreasing it.

Following is the summary for comparison of the crop reports of this Department for the month of November, 1913 and 1914:

	1913	1914
Wheat, acreage sown, per cent	88	95
Winter oats, acreage sown, per cent	81	91
Rye, acreage sown, per cent	80	93
Corn, bushels per acre	24	26
Cotton, pounds per acre	477	626
Millet seed, threshed, per cent	63	79
Stock peas, seed threshed, per cent	64	79
Sweet potatoes, yield, per cent	73	85
Late Irish potatoes, yield, per cent	57	77
Tobacco, pounds per acre	706	773
Broom corn, yield, per cent	51	92
Peanuts, yield, per cent	64	77
Live stock, condition, per cent	89	93
Young clover, condition, per cent	64	81
Alfalfa, condition, per cent	80	89

NOVEMBER CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT.	COUNTY.	Wheat—acreage sown.										Corn—bushels per acre.										Cotton—pounds per acre.										Milliet—seed threshed.										Stock Peas—seed threshed.										Sweet Potatoes—yield, per cent.										Late Irish Potatoes yield, per cent.										Tobacco—pounds per acre.										Broom Corn—yield, per cent.										Peanuts—yield, per cent.										Live Stock—condition.										Young Clover—condition.										Alfalfa—condition.											
		Wheat—acreage sown.	Winter Oats—acreage sown.	Rye—acreage sown.	Corn—bushels per acre.	Cotton—pounds per acre.	Milliet—seed threshed.	Stock Peas—seed threshed.	Sweet Potatoes—yield, per cent.	Late Irish Potatoes yield, per cent.	Tobacco—pounds per acre.	Broom Corn—yield, per cent.	Peanuts—yield, per cent.	Live Stock—condition.	Young Clover—condition.	Alfalfa—condition.																																																																																																																					
A	Mississippi River Section.	Lake	100	100	25	800	100	100	100	100	800	100	100	90	95	95																																																																																																																					
		Obion	100	100	30	700	75	20	40	50	700	90	50	80	40	40																																																																																																																					
		Dyer	100	100	20	600	75	75	75	100	700	100	100	100	100	90																																																																																																																					
		Lauderdale	85	80	20	700	100	100	65	80	700	100	100	100	100	100																																																																																																																					
		Tipton	75	95	30	300	70	100	100	100	700	100	100	100	90	90																																																																																																																					
B	Uppland Section of West Tennessee.	Shelby	100	100	30	800	100	90	90	95	800	100	100	90	45	85																																																																																																																					
		Weakley	100	100	30	800	100	90	90	95	800	100	100	90	45	85																																																																																																																					
		Gibson	100	100	20	800	100	95	80	75	800	100	100	95	90	95																																																																																																																					
		Crockett	100	100	20	600	50	50	90	85	700	100	100	90	35	90																																																																																																																					
		Madison	100	100	30	800	100	90	100	100	700	100	100	70	20	100																																																																																																																					
		Haywood	100	100	30	600	100	100	100	100	100	100	100	75	100	100																																																																																																																					
		Hardeman	100	100	25	800	100	75	75	100	700	100	100	80	50	95																																																																																																																					
		Fayette	100	100	25	800	100	20	90	100	800	100	100	95	100	95																																																																																																																					
		Henry	100	100	20	800	100	90	60	50	800	100	40	80	55	100																																																																																																																					
		Carroll	100	100	20	800	100	100	100	80	800	100	100	100	100	100																																																																																																																					
C	Western Section of Middle Tennessee.	Henderson	100	100	20	800	100	100	100	80	800	100	100	100	100	100																																																																																																																					
		Chester	100	100	20	800	100	75	75	100	700	100	100	90	90	100																																																																																																																					
		McNairy	100	100	20	800	100	100	100	100	700	100	100	100	100	100																																																																																																																					
		Benton	100	100	20	800	100	75	75	100	700	100	100	100	100	100																																																																																																																					
		Decatur	100	100	20	800	100	100	100	100	700	100	100	100	100	100																																																																																																																					
		Hardin	100	100	20	800	100	100	100	100	700	100	100	100	100	100																																																																																																																					
		Perry	100	100	20	600	100	90	85	100	700	100	100	90	50	100																																																																																																																					
		Humphreys	100	85	20	800	100	75	50	40	800	100	25	95	75	90																																																																																																																					
		Houston	100	100	20	800	100	25	75	30	800	100	100	100	100	100																																																																																																																					
		Stewart	100	100	25	800	100	20	90	75	700	100	100	100	100	100																																																																																																																					
C	Western Section of Middle Tennessee.	Montgomery	100	90	20	800	100	25	75	30	800	100	100	100	65	100																																																																																																																					
		Robertson	100	85	25	800	100	20	90	75	700	100	100	85	75	100																																																																																																																					
		Cheatham	100	100	25	800	100	20	90	75	700	100	100	100	100	100																																																																																																																					
		Dickson	100	100	25	800	100	20	90	75	700	100	100	100	100	100																																																																																																																					
		Hickman	100	100	25	800	100	20	90	75	700	100	100	100	100	100																																																																																																																					
		Lewis	100	100	25	800	100	20	90	75	700	100	100	100	100	100																																																																																																																					
		Wayne	100	100	25	800	100	20	90	75	700	100	100	100	100	100																																																																																																																					
		Lawrence	100	100	25	800	100	20	90	75	700	100	100	100	100	100																																																																																																																					
		Wayne	100	100	25	800	100	20	90	75	700	100	100	100	100	100																																																																																																																					
		Lawrence	100	100	25	800	100	20	90	75	700	100	100	100	100	100																																																																																																																					

NOVEMBER CROP REPORT FOR 1914—T. F. PECK, Commissioner of Agriculture

DISTRICT.	COUNTY.															
	Wheat—acreage sown.	Winter Oats— acreage sown.	Rye—acreage sown.	Corn—bushels per acre.	Cotton—pounds per acre.	Millet—seed threshed.	Stock Peas— seed threshed.	Sweet Potatoes— yield, per cent.	Late Irish Potatoes yield, per cent.	Tobacco—pounds per acre.	Broom Corn— yield, per cent.	Peanuts—yield, per cent.	Live Stock— condition.	Young Clover— condition.	Alfalfa—con- dition.	
G Central Section of East Tennessee.	Claiborne	90	100	...	25	...	75	...	80	...	...	...	95	100	...
	Hancock	...	...	...	20	...	20	100	85	...	...	...	95	85	...
	Anderson	85	95	90	...	...	...	...	...	...	...	...	...	...	...
	Granger	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Union	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Knox	...	...	...	30	...	...	...	...	...	...	...	...	...	...
	Rhea	70	75	65	...	...	...	75	70	...	...	85	90	85	...
	Roane	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Loudon	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	McMinn	90	85	85	30	800	100	100	95	80	...	75	100	80	70	
	Meigs	100	100	100	25	600	100	100	...	...	...	...	90	95	...
	Bradley	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Hamilton	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	James	...	...	...	...	...	...	...	...	...	...	...	...	...	...
H Mountain Section of East Tennessee.	Johnson	100	90	100	30	...	80	75	100	75	...	...	95	100	100
	Sullivan	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Carters	100	100	100	20	...	80	100	90	...	...	...	90	80	80
	Hawkins	100	100	100	30	...	...	...	...	...	...	...	100	90	...
	Washington	100	100	100	30	...	90	100	25	700	...	...	100	100	...
	Unicoi	...	...	...	...	...	...	...	...	...	...	...	...	...	...
	Greene	100	100	100	35	...	50	75	80	700	...	...	90	90	90
	Hamblen	100	50	100	30	...	50	...	...	...	...	...	90	100	100
	Jefferson	100	100	100	35	...	...	...	...	...	...	...	95	90	90
	Cocke	75	95	25	20	...	...	...	...	...	800	...	90	75	75
	Sevier	85	85	90	25	...	...	...	...	...	...	...	95	80	...
	Blount	100	100	100	35	...	...	100	100	...	...	100	75	90	100
	Monroe	100	100	...	25	600	100	100	100	...	...	100	95	90	...
	Polk	100	100	100	25	700	...	100	...	...	...	...	90	100	...
	State average		95	91	93	26	626	79	79	85	77	773	92	77	93	89

INDEX.

	Page.
Report of Commissioner T. F. Peck	5
Financial Report	6
Net Revenues of Department	9
Expenditure of Office Appropriation	9
Agricultural Development	10
Cooperation of Railroads	11
Diversification of Crops	11
Community Cooperation	13
Farm Demonstration	13
Institute Work	15
Division Institutes	15
Agricultural Special Train	17
Talks to Farmers	19
Printing and Distribution of Literature	21
Immigration	21
State Fair	22
Financial Report, State Fair	23
Farmers' Educational and Cooperative Union	25
Report of Dr. Geo. R. White, State Veterinarian	29
Number and Value of Livestock in Tennessee	29
Cost of Animal Diseases	30
Financial Statement	30
Special Orders	32
Hog Cholera	40
Work in Maury County	41
Maury County Report	42
State Anti-Hog Cholera Serum Plant, Report of Operation....	45
Sheep Scab	46
Texas Fever	46
Interstate Movement of Livestock	48
Feed, Seed and Fertilizer Inspection	51
Distribution of Fertilizer	52
Feed, Seed and Fertilizer Receipts	54
Report of J. W. Sample, State Chemist	59
Report of State Entomologist	61
Problems of Insect Control	61
Damage by Insects	63
Nursery Inspection	63

INDEX—*Continued.*

Orchard Inspection	64
Pruning and Spraying	64
County Correspondents	67
Report of Dr. J. S. Ward, State Inspector of Apiaries.....	70
Honey Harvest	70
Cause of 1914 Failure	70
Prospects for 1915	70
Bitter Honey	71
Inspection Work	71
Bitter Weed of the South	72
Extension Work	73
Demonstration and Instruction	74
Need of Education in Beekeeping	74
Bee Moth	76
Feeding	76
Report of J. J. B. Johnsonius, Assistant Commissioner of Immi- gration	79
Report of J. A. Dinwiddie, Assistant Commissioner of Agricul- ture for East Tennessee	83
Report of Jesse Tomlinson, Assistant Commissioner of Agricul- ture for Middle Tennessee	84
Report of R. T. DeBerry, Assistant Commissioner of Agricul- ture for West Tennessee	86

APPENDICES.

	Page.
Bee Keeping in Tennessee.	.
TENNESSEE AGRICULTURE, VOLUME 2.	
Anti-Hog Cholera Serum Plant	367
Beef Cattle	140
Bee Keeping on the Farm	110
Bee Keeping on the Farm	491
Better Farming	203
The Business Farmer	222
Calves and Hogs as a Dairy By-Product	265
Clover and Alfalfa	234
Common Diseases of Swine, Sheep and Cattle, and How to Control Them	226
Concentrated Commercial Feeding Stuffs	4
Conditions in the Seed Trade of Tennessee	40
Conservation of Agricultural Resources	167
Corn Club Work in Middle Tennessee	37
Crop Report for March	125
Crop Report for April	156
Crop Report for May	189
Crop Report for June	237
Crop Report for July	283
Crop Report for August	315
Crop Report for September	347
Crop Report for October	401
Crop Report for November	545
Crop Rotations	446
Country Newspaper as a Force in the Development of Agricul- ture, The	507
Dairying in Tennessee	464
Dairy Management	261
Decoration of the Home	33
Dipping Hogs	118
Diseases of Farm Animals	433
East Tennessee Farmers' Institute	131
Education of and for the Farm	425
Fable of the Calf Path	303
Fair Dates for 1913	123
Farm Boys Encampment	542

APPENDICES—*Continued.*

	Page.
Farmer and the Egg and Poultry Market, The	487
Farmers and Stock Raisers	300
Farm Profits	498
Feed and Seed Laws of Tennessee	453
Fertilizer Report for 1912	53
Fertilizer Rules and Regulations	89
Forage Poison	113
Fruit, Vegetable and Nursery Possibilities in Cumberland High-lands of Tennessee	104
Good Roads	419
Home Makers of Tennessee, The	108
Hog Cholera	357
Hints to Poultry Raisers	182
Importance of Seed Selection	25
Important Factors in Crop Production	460
Intelligent Use of Commercial Fertilizers	471
Irish Potatoes	112
Lessons of the State Fair, The	335
Maintenance of Soil Fertility	99
Middle Tennessee Boys' Corn Club	535
Middle Tennessee Farmers' Institute	407
Modern Horse Power Methods	248
Poultry Culture	243
Practical Methods of Insect Control	494
Problems of Life on the Farm	195
Proceedings of Home Makers' Association of Middle Tennessee	520
Profit in Good Hogs	340
Progress in Agriculture	485
Progressive Agriculture	216
Protective Vaccination	386
Protect the Birds	177
Pure Foods	36
Pure Seed	24
Rational Production of Farm Power, The	255
Relation of Beekeeping to Horticulture	91
Relation of the Press to Agriculture	504
Scientific Farming	137
Selecting Good Seed	105
Silo on the Farm, The	510
Sorghum Poison	170
State Chemical Laboratory	150

APPENDICES—*Continued.*

	Page.
Swine Feeding	429
Talks on Timely Topics	291
Tennessee Dairy Industry	119
Tennessee Feed Control Law	17
Tennessee Fertilizer Law	81
Tennessee Seed Law	43
Tennessee Veterinarians	278
Transferring in Beekeeping	145
Transmission of Typhoid Fever	483
Treating Scours in Calves	122
Tribute to Grass	152
Use of Commercial Fertilizers, The	179
Value of Good Roads	476
Warning Against Fake Hog Cholera Serums and Vaccines....	149
Weeds and How to Eradicate Them	27
West Tennessee Farmers' Institute	323

TENNESSEE AGRICULTURE, VOLUME 3.

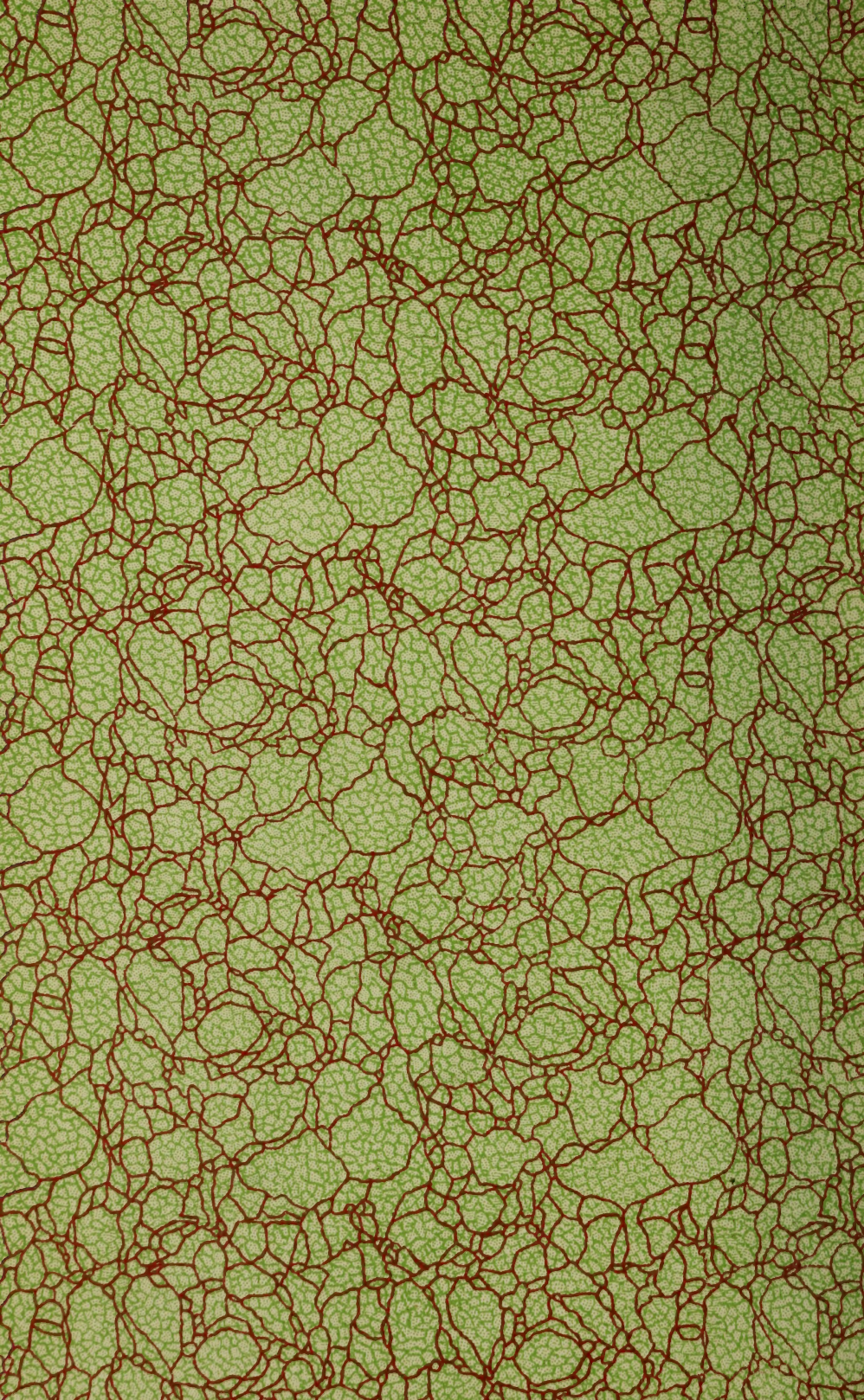
Advisability of Planting Tobacco	451
Agricultural Credits	347
Agricultural Special Completes Tour	361
Agricultural Special Train	249
Ayrshire	501
Beef Cattle	503
Breeds of Sheep	523
Breeds of Swine	514
Brood Diseases of Bees	277
Cattle Feeding	437
Combining Beekeeping and Farming	271
Coming Back to Tennessee	173
Community Cooperation	222
Community Cooperation	395
Composition of Feeding Stuffs	134
Concentrated Commercial Feed, Stuffs	101
Cooperative Marketing	428
Copartnership of the Railroads and the Farmer.....	229
Credit Needs of Southern Farmers	403
Crop Report for March	180
Crop Report for April	211
Crop Report for May	242
Crop Report for June	290

APPENDICES—*Continued.*

	Page.
Crop Report for July	321
Crop Report for August	355
Crop Report for September	387
Crop Report for October	482
Crop Report for November	530
Determined War Against Weeds	339
Digest of Tennessee Feed Law	105
Diseases of Garden Crops and Their Control	88
Doubling the Corn Crop	433
Education of the Tennessee Farmer	317
Eradication of Wild Onion	365
Farm Conveniences	77
Farmer and the Legislature, The	75
Farm That Won't Wear Out, The	176
Farragut School	313
Feed and Seed Laws of Tennessee, The	234
Feed Definitions	106
Fertilizer Bulletin for 1913	5
Fire Prevention	449
Free Market Bureau	73
Give the City Boy a Chance	156
Good Roads	411
Guernseys	496
Hog Cholera and Serum Treatment	415
Holstein	498
Home Makers' Section, Middle Tennessee Farmers' Institute...	461
How to Get the Full Value of Your Corn Crop.....	148
Importance of Good Seed	67
Intensive vs. Extensive Farming	79
Jerseys	491
Knapp School of Country Life	329
Keeping Records of the Dairy Herd	309
Legal Weights and Measures	375
Live Stock the Tennessee Farmers' Opportunity	83
Locating an Apiary	413
Meat Inspection	406
Measuring and Estimating Helps	59
Nectar and Pollen Bearing Plants of Tennessee	286
Number and Value of Domestic Animals in Tennessee	528
Opportunity	161
Organization and Cooperation	165
Proceedings East Tennessee Farmers' Convention.....	217

APPENDICES—*Continued.*

	Page.
Proceedings Middle Tennessee Farmers' Institute	393
Pure Bred Livestock.....	489
Railroads and the Farmer, The	153
Relation of Good Roads to Agriculture	159
Report of State Apiary Inspector	274
Rules and Regulations	53
Sheep in the South	348
Silage	305
Silos and Silage	456
Soil, the Farmers' Working Capital	300
Soy Bean as a Farm Crop.....	333
Stock Raising in Tennessee	289
Sweet Clover	70
Sweet Potato Culture and Storage.....	166
Tennessee Beekeepers' Association	285
Tennessee Fertilizer Law	46
Tennessee Seed Bulletin	187
Testing Garden Seed	210
Tour of the Agricultural Special	297
Trucking as a Side Line in Farming	169
Value of the Honey Bee	268
West Tennessee Farmers' Institute	370
What Size Silo to Build	56





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